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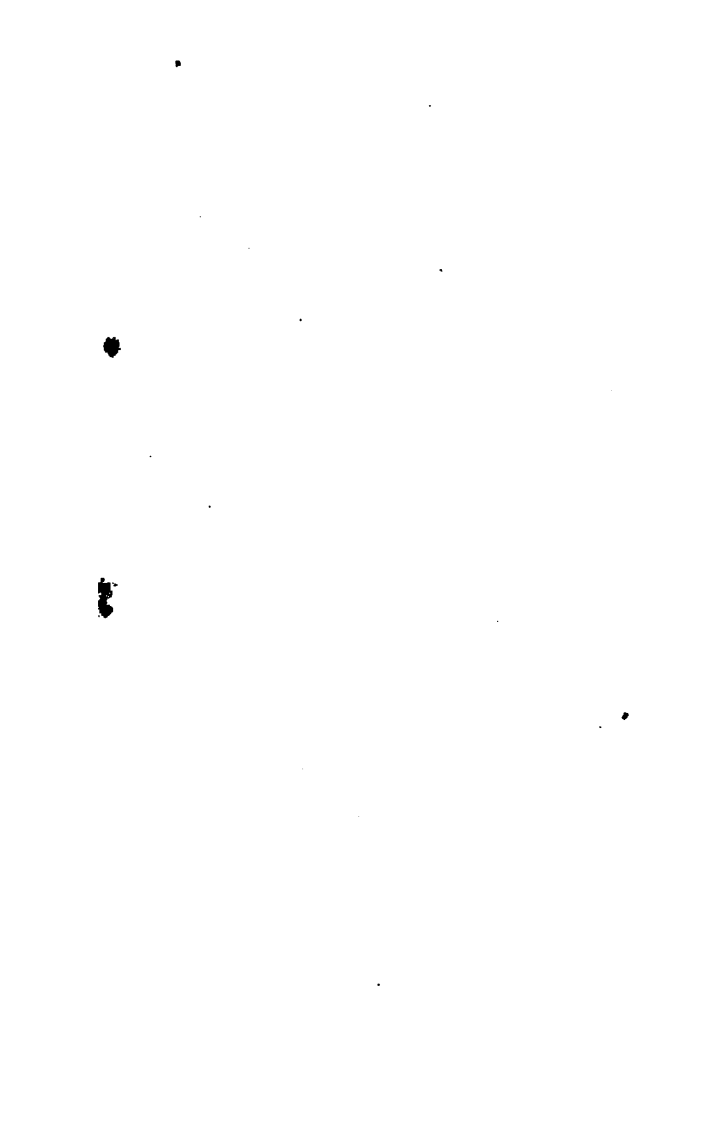
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# NEW

## REMEDIES AND PREPARATIONS.

Actæ'æ Rub. ex. fl. † ℥ 2..10 red baneberry, red cohosh.	†extrac'tum, † gr. 3.6
†Æs'culus gla'bra, gr. 1..5 buckeye [bark].	†flu'idum, 5 ¼..1
†extrac'tum fl. † gtt. 3.5	†Bi'dens bipinna'ta, 3 ¼..1 Spanish needles.
Hippocas'tani, 3 ½..1 horse chestnut [bark].	†extrac'tum fl. † 3 ¼..1
†extrac'tum fl. † 3 ½..2	†Bole'tus lar'icis, 3 ½..1 white or purging agaric, spunk.
†Alian'thus Glandulo'sa, gr. 10..30 tree of Heaven.	†extrac'tum fl. † 3 ½..1
†extrac'tum fl. gtt. 10.30	†Capsel'la bursa-pasto'ris, 3 ¼..1 shepherd's purse.
†Al'oïn, gr. ½..3	†extrac'tum fl. † 3 ¼..1
†Arctostaph'ylos glau'ca, gr. 10..30 manzanita leaves.	†Car'ya al'ba, 3 ½..1 shell- or shag-bark hickory.
†extrac'tum fl. † gtt. 20..60	†extrac'tum fl. † 3 ½..1
†Are'ca cat'e'chu, 3 1..6 Areca nuts.	†Çelas'trus scan'dens, 3 1..2 false or climbing bittersweet.
†extrac'tum fl. † 3 1..6	†extrac'tum fl. † 3 1..2
†Artemis'ia abrot. gr. 10..20 southernwood.	†Çentaure'æ bene. ex. fl. † 3 ¼..1 blessed thistle.
†extrac'tum fl. † ℥ 5..10	†Çephalan'thus occiden'ta- lis, 5 ½..1 button bush, pond dogwood.
†Asim'inæ tril'obæ, ex. fl. ℥ 5..20 common papaw [seeds].	†extrac'tum fl. † 3 ½..1
†Aspar'agi ex. fl. † 3 ½..1 asparagus.	†Çe'reus bonpl. ex. fl. † ℥ 5..20 one of the cacti.
Auran'tii ama'ri cort. 3 ½..1 bitter orange peel.	†Çicu'ta macula'tæ, ex. fl. † ℥ 1..15 American water hemlock.
†extrac'tum fl. † 3 ½..1	†Co'çæ extrac'tum, † gr. 3..15 coca [leaves].
†tinctu'ra, † 3 ½..2	†Cor'nus circi'na'ta, 3 ¼..1 green osler, round-leaved dog-wood.
†Be'læ fruc'tus ex. fl. † 3 ¼	†extrac'tum fl. † 3 ¼..1
†Ber'beris aquifol. † 3 ¼..1 California barberry [leaves].	

Reduce these doses to Metric terms by multiplying Grains or Minims by 6 ½, giving Centigrams; drachms by 4, giving Grams; Ounces by 82, giving Grams.

†Seriq'ea, red osier, swamp dogwood.	3 ¼..1	†extrac'tum fl ‡	3 1..2
†extrac'tum fl. ‡	3 ¼..1	†Jacaran'da proce'ra, gr. 20..60	
†Co'to cort. ex fl. ‡	℥ 1.5	caroba leaves,	
coto bark.		†extrac'tum fl. ‡	3 ¼..1
†Cu'cumis me'lo, m.u.k.kasson [seeds].	3 ½..1	†Jefferso'nia diph. ‡	3 ½..¼
†Citru'l'us, watermelon [seeds].	3 ½..2	twin leaf, rheumatism root.	
†extrac'tum fl. ‡	3 ½..2	†extrac'tum fl. ‡	℥ 10..20
†Drose'ræ, ex. ‡	gr. 1..3	†Magnif'era In'dica, ngo.	3 ¼..1
sundew.		†extrac'tum fl. ‡	3 ¼..1
†Epilo'bium angust.	3 ½..1	†Magno'lia acumina'ta, 3 1..2	
great willow herb.		magnolia [flowers] or cucumber tree.	
†extrac'tum fl. ‡	3 ½..1	†extrac'tum fl. ‡	3 1..2
†Epiphe'gus Virg. gr. 5..15		†Glau'ca, 3 ½..1	
cancer-root, bush drop.		magnolia [bark].	
†extrac'tum fl. ‡	℥ 5..15	†extrac'tum fl. ‡	3 ½..1
†Equisetum hyema'le, gr. 10..30		Melis'sæ text fl. ‡	3 ¼..1
horsetail, scouring rush.		baln.	
†extrac'tum fl.	℥ 10..30	†Menyan'thes trifolia'ta, 3 ¼..1	
†Eryn'gium aquat. gr. 1..20		buckbean [leaves].	
water eryngo, button snake root.		†extrac'tum fl. ‡	3 ¼..1
†extrac'tum fl. ‡	℥ 10..20	†Mika'nia gua'co, 3 ½..1	
†Eucalyp'ti ex. ‡ gr. 3..10		guaco.	
Euphor'bia tex. fl. ‡	℥ 1..15	†extrac'tum fl.	3 ½..1
large flow. ring spurge.		†Cenan'the phelland. gr. 5	
†Franke'nia grand. gr. 5..10		ter fennel seed, dropwort.	
yurba		†extrac'tum fl. ‡	℥ 2..6
†extrac'tum fl.	℥ 5..10	†Onosmo'dium Virg. 3 ¼..½	
†Gal'ium ve'rum, 3 1..2		false gromwell.	
ladies' or yellow bed-straw.		†extrac'tum fl. ‡	3 ¼..½
†extrac'tum fl. ‡	3 1..2	†Osmorri'za lon'gis. 31..2	
†Gnaphal'ium polyc. 3 ¼..1		sweet cicely [root].	
common everlasting.		†extrac'tum fl.	3 1..2
†extrac'tum fl. ‡	3 ¼..1	†Pancreat'inum, gr. 2..10	
†Grinde'lie comp. ex fl. ‡ 3 1		pancreatine.	
grindeia rob. senna and rhubarb.		†Parieta'ria suc'cus, 3 1..2	
†Helian'thus, ex. fl. 3 1..2		wall pellitory.	
sunflower seed.		†Pen'thorum sedoi'des, gr. 5..15	
Heu'chera, tex. fl. ℥ 5..10		Virginia stone crop.	
alain root.		†extrac'tum fl.	℥ 5..15
†I'lex Paraguayen'sis, 3 1..2			
Paraguay tea, mate.			

Reduce these doses to Metric terms by multiplying Grains or Minims by 64, giving Centigrams; drachms by 16, giving Grams; Ounces by 32, giving Grams.

Petroselin rad. tex. fl. †	3 ¼..1	Sabadilla tex. fl. †	℥ 5..15
parsley root.		cevadilla [seeds].	
sem'inis tex. fl. †	3 ¼..1	†Sabbatia Elliot'tii,	3 ½..1
parsley seed.		quinque flower.	
†Peumus boldus, † gr. ½..10		†extrac'tum fl. †	3 ½..1
boldo.		†Stella'ris,	3 ¼..1
†extrac'tum fl. †	℥ 1..10	variety of centaury.	
†Phoraden'dron flaves'cens,	3 ½..1	†extrac'tum fl. †	3 ¼..1
American mistletoe.		Salix al'ba,	gr. 1..60
†extrac'tum fl. †	3 ½..1	white willow [bark].	
†Pichu'rine,	gr. 10..20	†extrac'tum fl. †	3 ¼..1
the powdered beans.		†Ni'gra,	
†Pilocar'pi pinna. ex. † gr. 2..6		black willow [bark].	
jaborandi.		†extrac'tum fl. †	3 ¼..1
†Pilocarpi'næ nit. gr. ¼..¾		†Saponaria officina'lis,	3 ¼..1
nitrate of pilocarpin.		soapwort, bouncing Bet.	
†Pimpinella saxif'raga,	3 ¼..1	†extrac'tum fl. †	3 ¼..1
small burnet saxifrage.		Sarsaparilla †Americ.	3 ¼..1
†extrac'tum fl. †	3 ¼..1	American sarsaparilla.	
†Pi'peris methys. ex. † gr. 2..5		†extrac'tum fl. †	3 ¼..1
kava kava.		Ses'ami folio'rum,	3 ½..1
†Polemo'nium rep'tan. 3 ½..1		benue leaves.	
false Jacob's ladder, sweatroot.		†extrac'tum fl. †	3 ½..1
†Polyg'onum bistort. gr. 10..20		†Sima'bæ, ex. fl. †	gtt. 1..8
bistort.		cedron [seed].	
†extrac'tum fl. †	℥ 10..20	Simaru'bæ tex. fl. †	℥ 10..30
†Polym'niæ u. ex. † gr. ¼..½		simaruba bark.	
bearfoot.		†Sum'bul ex. †	gr. 2..6
†Polyt'richum junip'erum,	3 1..2	†Teu'crii ex. fl. †	3 ½..1
hair-cap moss, robin's rye.		water germander.	
†extrac'tum fl. †	3 1..2	†Thu'ja occidenta'lis,	3 ¼..1
†Pycnan'themum mont.	3 ¼..½	arbor vitae, false white cedar.	
mountain mint, basil.		†extrac'tum fl. †	3 ¼..1
†extrac'tum fl. †	3 ¼..1	Tormentilla, tex fl. †	3 ½..1
†Rhamni pursh. ex. † gr. 3..10		†Turne'ra aphrodis.	3 ¼..4
cascara sagrada.		damlana.	
†extrac'tum fl. †	3 ½..1	†extrac'tum, †	gr. 3..15
†Rudbeckia laciniata, 3 ¼..1		†flu'idum, †	3 ½..2
thimble weed.		†Urti'ca dioi'ca,	gr. 10..30
†extrac'tum fl. †	3 ¼..1	great stinging nettle.	
		†extrac'tum fl. †	℥ 10..30
		†Vi'ola tric'olor,	3 1..4
		pansy.	
		†extrac'tum fl. †	3 1..4
		†Zin'ci brom idum,	gr. ½..1

Reduce these doses to Metric terms by multiplying Grains or Minims by 6½, giving Centigrams; drachmas by 4, giving Grams; Ounces by 32, giving Grams.

## PILULÆ.

†Ague, (3)	1.3	†Chloral'is Hydrast. (5),	1.2
chinoidine, 2. oil pepper, 1-6.		†Christopher's Liver Pills.	
ext. coloc. co., 1-3,		cal. mel, 2. rhubarb, 1-2.	
sulph. iron, 1-2.		ipecac, 1-2.	
Ague, improved.	1.2	†Cinchonid'ise comp. (2),	1.3
sulph. cinchonida, 1. gel-		sulph. cinch.-acid., 1. arseni-	
semin, 1-16, xanthoxylin, 1,		ous acid, 1-32 iron reduc., 1.	
capsicum, 1-16		†comp. and strych. (2),	1.2
†Ammo'nii chlor. (3)	1.2	sulph. cinchonid., 1. arseni-	
†Ammo'nium picr. (2, 3)	1.2	ous acid, 1-20. iron reduc. 1.	
†Anodyne, (2½)		strych. 1-20.	
camphor, 1, acetate mor-		†and iron (2),	1.4
phia, 1-20, ext. henbane, 1,		sulph. cinchonid, 1. iron	
oil capsicum, 1-20.		reduc, 1.	
†Anti-Periodic (2)	1.2	†iron and strych. (3),	1.2
sulphate cinchonid. 1. sulphate		sulph. cinchonid., 1. sulph,	
strych, 1-33. sulph. iron, 1-2.		strych. 1-60. iron carb., 2.	
gelsemin, 1-20. podophyllin,		†Coc'cæ ext, (3),	1.3
1-20. res. capsicum, 1-10.		†Damiana ext. (3).	1.3
†Assafoet'ida (2-3),	1.3	†Diaphoretic.	1.2
†Beeberi'na sulph. (2),	1.2	m. rphia acetate, 1-25. powd.	
†Ber'beris aquif. ext. (3)	1.2	ipecac, 1-4. powd. nitrate	
tcomp (3)	1.2	potass, 1. powd. camph., 1.	
ext. berberis, 2. ext. cascara		†Diarrhoea Pellets (1-2).	1.3
sagrada, 1.		calomel, 1-8. sulphate mor-	
†Bilious Pill (Junge's),	1.	phia, 1-16. capsicum, 1-16.	
iod. manganese, 1-2. leptan-		po. ipecac, 1-32. camph. 1-10.	
driin 3-10. juglandin, 3-10.		†Emmenagogue (Rigaud's)	
sanguinarin, 1-5. ext. hen-		(3 1-2),	1.3
bane, 3-5.		sacot aloes, 1 1-2. powd.	
†Blue Pill (5).	1.2	rus, 3-4. powd. saffron, 3-4.	
†Blue Pill comp. (2 3-4),	1.2	powd. savin, 3-4.	
blue pill, 1. powd. ipecac, 1.		†Ferruginous (Bland's) (3) 1.3	
opium, 1-2.		sulph. iron, 1 1-2. potass.	
†Blue and Podoph. (See		carb. 1 1-2.	
Podoph. and Blue.)		†Fever and Ague.	
†Calabar Bean ext. (1-12)	1.2	alc. ext. eucalyptus, 1-4.	
†Camph. and Henb. (2)	1.3	chinoidine, 1. ferrocyanide	
camphor, 1. ext. henbane, 1.		of iron, 1-2. powd. capsicum,	
†Cascara Sag. ext. (2).	1.3	1-4. arsenic, 1-200.	
†Cathartic comp. (Chol-		†Fu'cus Vesiculo'sus (3),	1.3
agogue) (1),	1.2	†Grinde'lia Rob. (3),	1.3
podophyllin 1-2. ext. hen-		†Guaran'æ ext. (3),	1.3
bane, 1-8. oleo res. caps., 1-8.		†Ipecac and Opium (2),	1.2
blue mass, 1-4. ext. nux		powd. opium, 1-2. powd.	
vom. 1-16.		ipecac, 1-2. powd. sulphate	
†Ce'rii Oxa'las (1),	2	potass, 1.	
		equal to 2 1-2 grs dover's pow.	
		†and opium (4).	1
		double quantity of above.	

**Reduce these doses to Metric terms by multiplying**  
**Ounces or Minims by 31, giving Centigrams; drachms by**  
**ing Grams; Ounces by 32, giving Grams.**

†Ferri Brom'idum (1)	1.3	†morphiæ et zinei	
Jaboran'di (ext.) (3),	1.3	val. (1 1-4),	1.2
†Laxative,	1.2	phosph., 1-50. valerianate	
aloes, 1. sulphur, 1-5.		zinc, 1. sulph. morph., 1-12.	
podophyllin, 1-5. resin		†nuçis vom. et dami-	
guaiac, 1-2.		ana (2 -4),	1.2
†Liver Improved.	1.2	phosph. 1-100. ext. damiana,	
aloes, 1. jalap, 1. gamboge, 1-8.		2. ext. -8.	
leptandrin, 1-8. calomel, 1-8.		†opii et digitalis (1),	1.2
oil caps., 1-48 gtt.		phosph., 1-50. ipecac, 1-4.	
tr. verat. vir., 1-4 gtt.		fox glove, 1-2. opium, 1-4.	
†Liver Imp. Vegetable,	1.2	†et quiniæ (1),	1.2
aloes, 1. jalap, 1. gamboge, 1-8.		phosph., 1 50 gr.	
leptandrin, 1-8. podophyl. 1-8.		sulph. quini., 1.	
oil capsicum, 1-48 gtt.		†et quiniæ co., (1 8-4),	1.2
tr. verat. vir., 1-4 gtt.		phosph., 1-50. iron by hyd. 1.	
†Moore's Dyspepsia (2),	1.3	sulph. quini., 1-2.	
sulph. cinchonid., 1-2. ext.		strychnia, 1-60.	
caps., 1-2. rhubarb, 1.		†quiniæ et digitalis	
†Night Sweat (3),	1.3	co. (1 1-2),	
oxide zinc, 1-2. salicin, 1.		phosph., 1-50. sulph. quini.,	
hydrastin, 1. ext. belladn., 1-25.		1-2. ipecac, 1-4. fox glove,	
lactated pepsin, 1-2.		1-2. opium, 1-4.	
†Phosphorus, (1-25),	1.2	†quiniæ et nuçis	
†aloes et nuçis vom (3-4),	1.2	vom., (1 1-2),	1.2
phos., -50. t. vom.,		phosph., 1-50. ext. nux	
1-4. ext. aloes, 1-2.		vom., 1-4. sulph. quini., 1.	
†et belladonnæ,	1.2	†et strychniæ,	1.2
phosph., 1-100.		phosph., 1-50. strychn., 1-60.	
ext. belladonna, -8.		†strychniæ et ferri	
†et cannabis Ind. (1-4),	1.2	(1 1-2),	1.2
phosph., 1-50.		phosph., 1-100. carbonate	
ext. cannabis ind 1-4.		iron, 1. strychnia, 1-60.	
†et cantharis comp. (2),	1	†et zin'çi co., (2),	1
phosph., 1-50. sol. canthari-		phosph., 1-50. lupulin, 1.	
dis co. lm., powd. nux		sulph. zinc., 1.	
vom., 1.		†Quin. comp. & strychn. (2) 1.2	
†comp. (1-4),	1.2	sulph. quini., 1. arsenious	
phosph., 1-100.		acid, 1-20. iron reduc., 1.	
ext. nux vom., 1-4.		strychn., 1-20.	
†et digitalis co. (2),	1.2	†iron and strychn.	
phosph., 1-50. ext. herb., 1.		phosphates, (2),	1.3
powd. fox glove, 1.		phosph. quini., 1. phosph.	
†digitalis et ferri (2),	1.2	strychn., 1-60. phosph. iron, 1.	
phosph., 1-50. iron by hyd. 1.		†and Blue Pill (3 -4),	1.3
powd. fox glove, 1.		sulph. quini., 1. clove	
†et ferri (1 1-2),	1.3	pepper, 1-4. blue pill, 2.	
phosph., 1-100. carb. iron, 1.		†and Strychnia (1),	
		†Salicylic Acid (3),	1.3

Reduce these doses to Metric terms by multiplying  
Grains or Minims by  $6\frac{1}{2}$ , giving Centigrams; drachms by  
4, giving Grams; ounces by 32, giving Grams.

†Sandal Wood comp. (3), 1.3	†Triplex (Dr. Francis (4) 1.2
oil sandal wood, 1. ext.	socot. aloes, 1 1-5 blue
cubeba, 1. bals. copaiba, 1.	mass, 1 1-5. oil caraway, 1-5.
†Sedative (2), 1.3	scammony res., 1 1-5 gr.
ext. musk root, 1-2. ext. hen-	croton oil, 1-20 drop.
bane, 1-2. ext. valerian, 1-2.	tr. aloes and myrrh, 1 2.
ext. cannab. ind., 1-10.	†Vibur. Prunifol. Ext. (3), 1.3
†Senna Ext. (2), 1.4	†Wann's Bilious, 1.3
Scillæ Comp., U.S.P. (3), 1.3	ext. coloc. comp., 1.
squilla, 3-8. jam. ginger, 3-4.	podophyl., 1-4. ext. jalap, 1-4.
soap, 1 1-8 gr.	ext. henbane, 1-8. caustic, 1-4.
gum ammoniac, 3-4.	†Yerbae San'tæ Ext. (3), 1.3
†Sundew Ext. (3), 1.3	†Zin'ci Phosph. (1-10), 1.4
	tecum nu'cis vom. ¼) 1.2

## The Metric System in a Nut Shell.

### READY WAY TO METRIC WEIGHTS.

I. Grains, or Minims, multiplied by  $6\frac{1}{2}$  give Centigrams. EXAMPLE: 20 grains—130 centigrams, or 1 gram and 30 centigrams, expressed thus, 1.30.

II. Drachms (fluid or dry), multiplied by 4 give grams. EXAMPLE: 3 drachms—12 grams, expressed thus, 12.

III. Ounces (fluid or dry), multiplied by 32 give grams. EXAMPLE: 4 ounces—128 grams, expressed thus, 128.

### READY WAY FROM METRIC WEIGHTS.

I. Centigrams divided by  $6\frac{1}{2}$  equal grains or minims

II. Grams divided by 4 equal drachms (fluid or dry).

III. Grams divided by 32 equal ounces (fluid or dry).

### EXCEPTIONS.

These Rules do not give the EXACT values, but they are near enough for ALL PRACTICAL PURPOSES. See page 98. You get less of a drug, usually prescribed in grains or minims, at a dose when employing these metric rules than in the old way; but it is the merest fraction of a grain or minim less.

I. For Syrups and Glycerines add  $\frac{1}{8}$  more. EXAMPLE: 4 ounces of syrup of rhubarb equal 128 grams PLUS  $\frac{1}{2}$  gram (the extra  $\frac{1}{8}$ ), or 170 grams.

II. Chloroform, Essential Oils, Honey and Liquid Acids must not be prescribed by these rules. Specific

*Reduce these doses to Metric terms by multiplying Grains or Minims by  $6\frac{1}{2}$ , giving Centigrams; drachms by 4, giving Grams; Ounces by 32, giving Grams.*

**Gravities.** Chloroform, 1.49; ol. bitter almonds, 1.06; ol. cinnamon, 1.03; ol. turpentine, 0.864; ol. sweet almonds, olive, linseed, castor and codliver from 0.91 to 0.95. Acid hydrochloro., 1.27; nitric, 1.52; sulphuric, 1.85; acetic, 1.06; tar, 1.15.

As liquids are usually dispensed by our American druggists in graduates marked by the gram measure of ordinary tinctures, no attention need be paid to the differences of specific gravities given above, or the prescription blanks, as we furnish them, could have it specially stated upon them that "all liquids are considered of the sp. gr. of water."

#### A METRIC POINT.

Since using the metric system in prescribing, we have "stumbled," as it were, upon the following handy method of "dosing" a drug. It is as follows:—When making use of a *two-ounce* mixture, remember that the number of *grams* ordered of any medicament should be exactly the dose in *minims* or *grains* of the medicine. In other words, write (for a *two-ounce* mixture) the same number of *grams* of a remedy that you wish *grains* or *minims* administered. This is a very remarkable coincidence, and reduces metric prescription-writing to a play spell, as no arithmetical calculation is needed to properly apportion the quantity of a drug after once knowing its dose in grains and minims.

As an example: Say you wish to give *one* minim of belladonna, fluid extract; *two* minims of nux vomica, fluid extract; and *eight* grains of bromide of potash at a dose. It would be written thus:—

R <sup>x</sup>	Grams.
Fl. Ext. Belladonnæ . . . . .	1
Fl. Ext. Nucis Vomiceæ . . . . .	2
Potassii Bromidi . . . . .	8
Aquæ Menth. pip., q. s., ad℥.	61

You thus virtually substitute grams for minims and grains, and that is the end of the matter.

If you wish to order a *four-ounce* mixture, you simply write *double* the quantity of grams that the dose of the remedy is in grains or minims.

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Reduce these doses to Metric terms by multiplying Grains or Minims by  $\frac{1}{48}$ , giving Centigrams; drachms by 4, giving Grams; Ounces by 32, giving Grams.





## LIST OF DOSES.

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Decoctions, infusions, and waters have, for the most part, been omitted; they will be found classified at the end of the dose-list. Doses enclosed in [ ] are emetic. Doses or preparations in ( ) are to be used with great caution.

Preparations preceded by a † are non-official though most of them are in common use.

Parke, Davis and Co., Manufacturing Chemists, Detroit, make all preparations in this list followed by a ‡.

The last dose is the maximum given and is *too large* for general use.

The letter *f* has been omitted from before the sign of fluid-drachm and fluid-ounce.

Where, alphabetically, the first preparation of a drug throws the drug-name into the genitive form, it has been so written; the other preparations following under that head: so also in regard to the nominative; any change to the nominative or genitive, as the case may require, will be patent to the reader.

<b>A.</b>		Achille'æ, †ex. fl.‡	5½..1
Absin'thium,	3 1..2	<i>yarrow.</i>	
	<i>wormwood.</i>	†o'leum,	gtt. 5..20
†extrac'tum,‡	gr. 10..20	†tinctu'ra,‡	5 1..4
†o'leum,	gtt. 4..8	Aç'idum aç'eticum dil.	3 1
†tinctu'ra comp.‡	5 2..4	†arsen'icum,	gr. 1-20th
Aca'ciæ syru'pus,‡	q. s.	arsenio'sum,	gr. 1-20..1-10
<i>syrup of gum Arabic.</i>		<i>commercial arsenic.</i>	
Ace'tum,	5 1..4	benzo'icum,	gr. 10..30
<i>vinegar.</i>		†carbazo't'icum,	gr. ¼..1
†syru'pus,‡	5 1..2	carbol'icum,	gr. 1..2

Reduce these doses to Metric terms by multiplying Grains or Minims by 6½, giving Centigrams; drachms by 4, giving Grams; Ounces by 32, giving Grams.

## DOSE LIST.

glyceri'tum,	℥ 5..10	Æther,	3 ½..1
it'ricum,	gr. 5..30	tace'ticus,	gtt. 15..30
syru'pus,†	3 1..8	thydi'od'icus,	gtt. 15 <i>inh.</i>
gal'licum,	gr. 5..30	†muriat'icus,	gtt. 5..30
glyceri'tum,	℥ 20..60	nitro'si spir'itus,	℥ 10..60
thydi'od'icum dil.	℥ 2..30	<i>sweet spirit of nitre.</i>	
hydrocyan'icum dil.	℥ 2..3	tozon'icus,	℥ 10..30
lac'ticum,	3 ½..1	†sulphur'ici spr.	3 ½..2
muriat'icum,	℥ 10..20	†aromat'ici spr.	3 ½..1
dilu'tum,	℥ 20..60	<i>sweet elixir of vitriol.</i>	
nit'ricum,	℥ 5..20	compos'itus spr.	3 ½..2
dilu'tum,	℥ 20..40	<i>Hoffman's anodyne.</i>	
nitromuriat'icum,	℥ 2..5	†tinctu'ra cam.	gtt. 30..30
dilu'tum,	℥ 10..20	†syru'pus,	3 ½..3
oxal'icum,	gr. ½..1	†Agar'icum,	gr. 5..30
phosphor'icum dil.†	℥ 10..60	<i>spunk, tinder.</i>	
†pyrolig'neum,	gtt. 10..30	†Aga've America'næ tr.†	3 1..2
†salicy'licum,	gr. 5..15	<i>American aloe, century plant.</i>	
sulphur'icum,	℥ 1..2	†Agrimo'nise ex. fl.†	3 ½..1
aromat'icum,†	℥ 8..10	†Allan'thus gland.	gr. 5..30
dilu'tum,	℥ 8..10	<i>tree of heaven.</i>	
sulphuro'sum,†	f 3 1	Al'cohol,	3 ½..1
tan'nicum,	gr. 1..10	dilu'tum,	3 ½..1
glyceri'tum,	℥ 10..40	†Aju'ga chamaep'itys,	3 1..2
tartar'icum,	3 1..2	<i>ground pine.</i>	
†syru'pus,†	3 1..4	†Al'etrin,†	gr. 1..5
valerian'icum,	gtt. 4..5	†Al'etris,	gr. 10
Aconi'ti fo'lia,	gr. 1..2	<i>unicorn root.</i>	
extrac'tum,†	gr. ¼..1	†extrac'tum alch.†	gr. ½..2
†flu'idum,†	gtt. 2..6	†flu'idum,†	3 ½..1
†tinctu'ra,†	gtt. 20..30	†tinctura,	3 ½..1
radi'cis tex.†	gr. ¼..1	†Alis'mæ plant. fo'lia,	3 1
†extrac'tum fl.†	gtt. 1..4	<i>water plantain.</i>	
tinctu'ra,†	gtt. 3..6	†ra'dix,	gr. 5..30
Aconi'tia,	gr. 1-100th	Al'tium,	3 1
†Aconiti'na,†	gr. 1-16..1-6	<i>garlic.</i>	
†Æs'culin,	gr. 5..30	†extrac'tum fl.†	3 ½..1
†Æs'culus.	3 ½..1	†suc'cus,	3 ½
<i>horse chestnut bark.</i>		†syru'pus,†	3 1
		†Al'nuin,†	gr. 1..5
		†Al'nus,†	3 ½
		Al'oë,	gr. 2..30
		<i>tag alder.</i>	
		<i>aloes.</i>	
		†cum zingibe'ri,†	gr. 10..20

Reduce these doses to Metric terms by multiplying Grains or Minims by 64, giving Centigrams; drachmas by 4, giving Grams; Ounces by 32, giving Grams.

†decoc'tum comp.†	3½-2	†elix'ir,†	3 1.4
†extrac'tum,†	gr. 1.5	†carbazo'as,	gr. 1.2
†flu'idum,†	gtt. 10.60	carbo'nas,	gr. 2.10 [30]
pil'ula,†	gr. 4.12	chlor'idum,	gr. 5.30
et assafoet'idæ,	gr. 10	†chloroau'ras,	gr. 1-10
†et colocyn'th.†	gr. 5.10	†for'mias,	gr. 5
†et fœ'tidis,†	gr. 15.20	†hypophos'phis,	gr. 10.60
†et fer'ri,†	gr. 3.9	†hyposul'phis,	gr. 15.60
†et gambo'giæ,†	gr. 10.30	iod'idum,	gr. 1.3
†et jala'pæ,†	gr. 10.30	†nitrosul'phas,	gr. 13
†et cincho'næ,†	gr. 10.20	†phos'phas,	gr. 10.40
et mas'tiches,†	gr. 3.6	†sul'phis,	gr. 15.60
et myr'rhæ,†	gr. 10.20	valeria'nas,	gr. 2.3
pul'vis †compos'ita, 3¼.1		†elix'ir,†	3 1
et canel'æ,	gr. 10 20	†et mor'phiæ,†	3 1
tinctu'ra,†	3 ½.1	†et quin'ia,†	3 1
et myr'rhæ,†	3 1.2	†et strych'nia,†	3 1
vi'num,†	3 ½.2	†Ampelop'sin,†	gr. 2.4
Althæ'æ †tex. fl.†	3 1.2	†Ampelop'sis ex. fl.†	3 ½.1
marsh mallow.		American ivy, Virginia creeper	
†syru'pus,†	3 1.3	Amyg'dalæ am. ol. gtt. ¼.1	
Alu'men,	gr. 5.20 [190]	oil of bitter almonds	
Alumin'li †et fer. sul.gr. 5.10		a'qua,†	3 ½
et potas'sii sulph. gr. 5.20		syru'pus,†	3 ½.1
†Ama'ris pulv. comp. gr. 20		†Per'siçæ tinctu'ra.†	3 1
†Am'bergria,	gr. 5.60	peach kernels.	
Ammoni'acum,	gr. 10.30	†Am'yl nitrite,	gtt. 1.2
ammoniac gum.		†Am'yli glyceri'tum,	3 1.2
Ammo'nia a'qua,† gtt. 10.30		starch, and preparations.	
spir'itus,†	gtt. 10.30	†iod'idum,	3 1.2
hartshorn.		†syru'pus,†	3 1.2
aromat'icus,†	℥ 20.60	†An'dæ o'leum,	gtt. 20.60
†fœ'tidus,†	3 ½.1	†Andi'ra iner'mis,	gr. 20.30
Ammo'nii acet. liq.†	3 ½.1	cabbage tree bark.	
spirit of Mindererus.		†extrac'tum,	gr. 3
†arse'nias,	gr. 1-60.1-25	†Anemo'ne pratens.,	gr. 1.3
benzo'as,	gr. 10.30	meadow anemone.	
†bicarbo'nas,	gr. 10.60	†tinctu'ra,†	3 ½
†bo'ras,	gr. 10.20	†Angel'icæ ex fl.†	3½.1
†bisul'phis,	gr. 15.60	angelica root.	
brom'idum,	gr. 2.20	Angustu'ra,	gr. 10.30
		†extrac'tum fl.†	℥ 10.30
		†An'ilin sul'phas,	gr. 1.3

Reduce these doses to Metric terms by multiplying Grains or Minims by 64, giving Centigrams; drachms by 4, giving Grams; Ounces by 32, giving Grams.

Ani'sum, <small>anise seed.</small>	gr. 10..20	†Ara'nese te'la, <small>cob-web, spider's web.</small>	gr. 5..20
o'leum,	gtt. 2.6	†Arc'tium lap'pa, <small>barbcock.</small>	3 1
spir'itus, †	3 1	textrac'tum, †	gr. 5..20
†Anthrakok'ali,	gr. 1.2	†flu'idum, †	3 ½..1
†sulphure'tum,	gr. 1.2	†Are'ca, <small>betel nut.</small>	3 1.4
An'themis, <small>chamomile.</small>	gr. 20..60	†Argemo'ne Mexic., <small>prickly poppy, yellow thistle.</small>	gr. 5..10
textrac'tum, †	gr. 5..20	to'leum, <small>silver (and salts).</small>	gtt. 15..[45]
†flu'idum, †	3 1	†Argen'ti chlor'idum, <small>silver (and salts).</small>	gr. 1.3
to'leum, <small>gr. 5..6</small>	gtt. 5.6	tiod'idum,	gr. 1..2
Antimo'nii et pot. tart., <small>tartar emetic.</small>	gr. 1-16..[2]	ni'tras,	gr. ¼..4
tiod'idum,	gr. ¼..1	ox'idum,	gr. 1
ox'idum,	gr. 2..3	†Armora'cia, <small>horse radish.</small>	3 ½..1
oxysulphure'tum, <small>kermes mineral.</small>	gr. 1.3	textrac'tum fluid, †	3 ½..1
pil'ula,	gr. 3..10	†spir'itus comp. †	3 1.4
†pul'vis comp. †	gr. 1..4	†syru'pus comp. †	3 2.8
†sulphura'tum, <small>James' powder.</small>	gr. 1..[10]	Ar'nica, <small>leopard's-bane.</small>	gr. 5..20
†sul'phur aura'tum, <small>precipitated sulphuret.</small>	gr. 2..6	extrac'tum, †	gr. 5..10
vi'num, <small>golden sulphur of antimony.</small>	3 ½..[1]	flu'idum, †	gtt. 10..30
†Ap'iod, <small>parsley oil.</small>	gtt. 5..6	tinctu'ra, †	3 ½..2
†Apoc'ynin, †	gr. ½..[2]	Arsen'ici chlo. lq. †	℥ 2.8
Apoc'ynum andr., <small>dog's-bane, bitter root.</small>	gr. 10..[30]	iod'idum,	gr. ½
textrac'tum, †	gr. 2..[8]	et Hydrarg. lq. †	gtt. 5..20
†flu'idum, †	gtt. 10..[30]	†Artemis'ise v. ex. fl. †	3 ½..1
†tinctu'ra, †	3 1..[3]	<small>Donovan's solution.</small>	
Cannab'inum, <small>black Indian hemp.</small>	gr. 4..[20]	†A'rum triph., <small>Indian turnip.</small>	gr. 10..20
textrac'tum, †	gr. 1.4	textrac'tum fl. †	℥ 5..20
†flu'idum, †	℥ 4..[2]	As'arum Canadense, <small>Canada snake-root.</small>	gr. 20..30
Ara'lis + His'p. fl. ex. †	3 1..2	textrac'tum fluid, †	3 ½..1
Nudicaul'is, <small>small spikenard, American saffron.</small>	<i>Info.</i>	†Europæum, <small>redhead, blood weed.</small>	gr. 10..[6]
†syru'pus comp. †	3 1..4	†Ascle'pias curass., <small>fresh-colored asclep., white Indian hemp.</small>	gr. 10..[40]
†Raçemo'sæ fl. ex. †	3 1..2	Incarna'ta, <small>common milkweed.</small>	gr. 20..60
Spino'sa, <small>American spikenard.</small>	<i>Info.</i>	textrac'tum fl. †	gtt. 20
†tinctu'ra, †	gtt. 10..60	Syri'aca, <small>prickly elder or ash.</small>	gr. 20..60
		textrac'tum fl. †	gtt. 10..20
		†tinctu'ra, †	℥ 10..60

Reduce these doses to Metric terms by multiplying Grains or Minims by 64, giving Centigrams; drachmas by 4, giving Grams; Ounces by 32, giving Grams.

Tubero'sa, butterfly weed, pleurisy root.	gr. 20..60	Ba'rii chlo. li'quor, barium (and salts.)	gtt. 5
†tex. alcohol.†	gr. 3..15	†iod'idum,	gr. 1/2
†flu'idum,†	3 1/2..2	†Bdel'lum, Indian myrrh.	gr. 10..40
†pul'vis comp.	<i>Inf.</i>	†Bebe'riae sul'phas,†	gr. 2..5
†Asclep'idin,†	gr. 1..5	†Be'læ ex. flu'idum,†	3 1..3
†Aspar'agi ex.† asparagus.	3 1/2..1	Belladon'na, deadly nightshade.	gr. 1
Assafœt'ida,	gr. 5..15	extrac'tum,	gr. 1/4..1/2
mistu'ia,†	3 1/2..1	flu'idum,	gtt. 2..6
pil'ula,†	gr. 4..12	tinctu'ra,	gtt. 10..30
†compos'ita,†	gr. 2..4	†Benzo'in odor.ex. fl.†	3 1/2..1
†et fer'ri,†	gr. 6..12	Benjaminæ, fever, or spice bush.	
†et rhe'i,†	gr. 6..12	Benzo'inum,	gr. 10..30
†syru'pus,†	3 1/2	ac'idum,	gr. 10..30
tinctu'ra,†	3 1/2..1	tinctu'ra comp.†	3 1/2..2
†compos'ita,†	3 1	†Ben'zole,	m. 10..30
†As'teris punice'i tr.†	3 1/2..2	benzene.	
coenach, red topped aster.		Berberis,	<i>Inf.</i>
†Atherosper'mæ ol.	gtt. 1	barberry.	
Australian sassafras.		†extrac'tum fluid.†	3 1..2
Atro'pia,	gr. 1-100..1-30	†Berberi'næ mur.†	gr. 1..10
sul'phas,	gr. 1-100..1-30	†sul'phas,†	gr. 2..5
atropine.		†Bismu'thi et am. cit.†	gr. 2
†valeria'nas,	gr. 1-100	bismuth.	
Au'ri cyan'idum,	gr. 1-20..1/8	†li'quor,†	3 1
gold (and salts).		†carbo'nas,	gr. 5..15..45
†iod'idum,	gr. 1-15..1-10	†et strych'nia elix.†	3 1..2
et so'dii chlorid.	gr. 1-12	†et igna'tiæ pil.†	gr. 4..8
†ox'idum,	gr. 1-10	†et nu'cis vom.pil.†	gr. 4..10
Auran'tii confect.,	gr. 10..60	subcarbo'nas,	gr. 5..45
orange peel or flowers		subni'tras,	gr. 5..15
cor'ticis ex. fl.†	3 1..2	†tan'nas,	gr. 30..60
syru'pus,	q. s.	†valeria'nas,	gr. 1/2..3
tinctu'ra,†	3 1..2	†Bistor'ta,	gr. 10..30
flo'rum syru'pus,†	q. s.	Braye'ra,	3 1/2
Azed'arach,	gr. 20	kooso.	
		†extrac'tum flu'id.†	3 2..8
		†Bromi'ni solutio,	gtt. 2..6
		Goldsmith's solution bromine.	
		†Bru'cia,	gr. 1-16..1
		Bryo'nias al'ba,	3 1..3
		bryony.	

## B.

†Baptis'ia ex. alch.†	gr. 1..4
wild indigo.	
extrac'tum fluid.†	3 1/2..1/2
†Bap'tisin,†	gr. 1/2..1/2

Reduce these doses to Metric terms by multiplying Grains or Minims by 64, giving Centigrams; drachma by 4, giving Grams; Ounces by 32, giving Grams.

†extrac'tum fl.†	gtt. 10.60	†potas.so.et fer.syr.†	3 1.2
†Bryo'nin,†	gr. 1.2	†hyposul'phis,	gr. 10.20
Bu'chu,	gr. 10.30	†iod'idum,	gr. 1/2.3
†elix'ir,†	3 1.2	†lacto-phosph. syr.†	3 1/2.1
†compos'itum,†	3 1.3	†tet peps'i'næ syr †	3 1/2.1
†et parei'ræ,†	3 1.2	phos'phas præcip. gr.	10.30
†extrac'tum,†	gr. 20.30	†sul'phidum,	gr. 1/2.1/2
flu'idum,†	3 1/2.1	†sul'phis,	gr. 15.60
†compos'itum,†	3 1/2.1	Cal'cis li'quor,	3 1.4
†et parei'ræ,†	3 1/2.1	<sup>lime water.</sup>	
†tinctu'ra,†	3 1.4	†chlora'tæ li'quor, m	20.60
†Butyl-chlo'ral,	gr. 5..(45)	†sachara'tus lq.	3 1/2.1
†Bux'us sempervir.,	3 1/2.1	†syru'pus,†	3 2.4
<sup>box tree.</sup>		†Calen'dulæ extract.†	gr. 4.6
		<sup>garden marygold.</sup>	
		†extrac'tum fluid.†	3 1/2.1
		†Calisa'yæ elix'ir,†	3 1.4
		†et fer'ri protox.†	5 1.2
		†pyrophos'phas,†	3 1.2
		†et bismu'thi.†	3 1.2
		†Fer'ri, bismu'thi et	
		pepsi'næ.†	3 1.2
		†Fer'ri, bismu'thi et	
		strych'niæ,†	3 1
		†Fer'ri et strych.†	3 1
		†Fer'ri, strych'niæ et	
		pepsi'næ.†	3 1
		†vi'num et fer'ri pyro-	
		phospha'tis,†	3 1
		†Calot'ropls gigant.	gr. 3.12
		<sup>madar or mudar.</sup>	
		Calum'ba,	gr. 10.60
		<sup>columbo.</sup>	
		†extrac'tum †	gr. 5.15
		flu'idum,†	3 1/2.1
		tinctu'ra,†	3 1.4
		Cam'phora,	gr. 5.10
		<sup>camphor.</sup>	
		†emul'sio,	3 1.8
		†m'stu'ra comp.†	3 1.4
		†monobroma'ta,	gr. 2.10
		o'leum,	gtt. 2.8

## C.

†Cac'ti grandifl.ex.fl.†	gtt.2.5
<sup>night-blooming cereus.</sup>	
†tinctu'ra,†	gtt. 2.5
†Caffe'i'a,	gr. 2.10
<sup>cafein.</sup>	
†çi'tras,	gr. 1
†lac'tas,	gr. 1
†ma'las,	gr. 1
†mu'rias,	gr. 1
†Caln'çæ ra'dix,	3 1.3
†extrac'tum,†	gr. 10.20
Cajupu'ti o'leum,	gtt. 1.5
†mistu'ra comp.†	gtt. 20.60
Cal'amus,	3 1.3
<sup>sweet flag.</sup>	
†extrac'tum fl †	3 1/4.1
Cal'çii †bicarb. lq.	3 1.2
<sup>lime (and salts).</sup>	
†bisul'phis,	gr. 15.60
carb. præcip.	gr. 10.30
chlor'id lq.	3 1/2.1
hypophos'phis,	gr. 10.30
†et so'dii syr.†	3 1
†potass. et so'dii syr.†	3 1

**Reduce these doses to Metric terms by multiplying Grains or Minims by 64, giving Centigrams; drachms by 4, giving Grams; Ounces by 32, giving Grams.**

spir'itus, †	℥ 5.67	†extrac'tum fl. †	℥ 10.30
Canel'la,	gr. 10.40	o'leum,	gtt. 2.6
et al'oës pulv.	gr. 10.20	Cascaril'la,	gr. 10.30
hikry pikry.		†extrac'tum, †	gr. 10.20
†extrac'tum, †	gr. 5.20	†flu'idum, †	3 ½.1
†flu'idum, †	3 ½.1	†tinctu'ra, †	3 ½.2
Can'nabis In'dicæ ex.	gr. ¼.2	Ca'sia fis'tula,	3 1.4
Indian hemp.		purging cassia.	
†extrac'tum fl. †	gtt. 5.15	†consec'tio,	3 ½
tinctu'ra, †	℥ 10.60	Marilan'dica,	3 1.4
Can'tharis,	gr. 1.2	American, or wild senna.	
Spanish fly.		Casta'neæ tex. fl. †	gtt. 5.60
†ace'tum,	℥ 6.16	chestnut leaves.	
extrac'tum fl. †	gtt. 1.2	Casto'reum,	gr. 10.30
tinctu'ra, †	℥ 10.60	caster.	
†Caout'chouc,	gr. 1.2	tinctu'ra, †	3 ½.2
India-rubber.		†ammonia'ta, †	3 ½.2
Cap'sicum,	gr. 5.10	Cata'ria, tex. fl. †	3 1.2
Cayenne pepper.		catnip.	
†extrac'tum, †	gr. ¾.½	Cat'echu,	gr. 10.30
†ethe'reum, †	gtt. ⅓.½	†consec'tio comp.	3 ½.1
†flu'idum, †	gtt. 5.20	†extrac'tum fl. †	℥ 10.30
oleoresi'na,	gtt. ½.1	†pul'vis comp.	gr. 10.20
tinctu'ra, †	3 1.2	tinctu'ra, †	3 ½.3
Car'bo anima'lis,	gr. ½.3	†Caulophyl'i ex. †	gr. 1.5
animal charcoal.		blue cohosh.	
Li'gni,	3 ½.3	†extrac'tum fl. †	gtt. 10.30
wood charcoal.		†fl. comp. †	℥ 10.30
Cardamo'mi tex. fl. †	3 ½.1	†tinctu'ra, †	3 1.2
cardamon.		†compos'ita, †	3 ½.1
†tex. fl. comp.	3 ½.1	†Caulophyl'in, †	gr. ¾.4
tinctu'ra,	3 1.2	†Ceano'thi Am. ex. fl. †	3 ½.1
compos'ita, †	3 1.2	New Jersey tea.	
†Ca'ro, fer. et vi'num, †	3 1.4	†syru'pus comp. †	3 1.4
beef, iron and wine.		†Ce'dron (Sima'ba),	gr. 1.10
Caro'ta,	3 1.3	†Celastr'i scan'd. ex. †	gr. 5.10
carrot seed.		false bittersweet.	
Car'thamus,	Inf.	†Centaure'a benedicta,	3 1.3
saffron.		blessed thistle.	
Ca'rum,	3 1.3	Ce'ril ox'alas.	gr. 1.2
caraway seed.		cerium (and salts).	
†extrac'tum fl. †	3 ½.1	†ni'tras,	gr. ½.1
o'leum,	gtt. 1.10	†Chelido'nium maj.	3 ½.1
†tinctu'ra, †	gtt. 20.60	celandine, tetterwort.	
Caryophyl'lus,	gr. 5.10	†extrac'tum, †	gr. 5.10
cloves.			

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†flu'idum,†	3 ½..1	Çincho'na,	3 ½..1
†suc'cus,	gtt. 10..20	Peruvian bark.	
†tinctu'ra,†	3 1..2	extrac'tum,†	gr. 10..30
†Chelo'nes ex. fl.†	3 ½..1	flu'idum,†	3 1..2
balmony.		†aroma'ticum,†	3 ½..2
†tinctu'ra,	3 1..2	†compos'itum,†	3 ½..1
†Chelo'nin,†	gr. 1..4	tinctu'ra,†	3 1..4
Chenopo'dium,	3 1..2	†ama'ra,†	3 1..2
seed.		†ammonia'ta,†	3 ½..2
†extrac'tum fl.†	3 ¼..1	†æthe'ria comp.†	3 ½..1
†mistu'ra comp.†	3 ½..1	compos'ita,†	3 1..4
o'leum,	gtt. 5..10	†ferra'ta,†	3 1
†Chico'rii syr. comp.†	3 1..4	†vi'num aromat.†	3 1..4
succory, comp. syrup of.		Çincho'nia sulph.	gr. 1..10
Chimaph'ilæ tex.†	gr. 10..30	†Çinchonid'ia sulph.	gr. 2..10
pipalæswa.		†Çincho-quin'ia,	gr. 1..6
extrac'tum fl.†	3 ½..1	Çinnamo'mum,	3 ½..1
†Chimaph'ilin,†	gr. 1..5	cinnamon.	
†Chiococ'cæ radix,	3 1..3	†extrac'tum fl.†	gtt. 15..30
cabluca.		o'leum,	gtt. 1..2
†extrac'tum,†	gr. 10..20	†pul'vis comp.	gr. 10..20
†Chionan'thi fl. ex.†	3 ½..1	spir'itus,†	℥ 10..30
fringe tree.		†syru'pus,†	3 1..2
Chiret'ta,	gr. 20	tinctu'ra,†	3 1..3
†extrac'tum fl.†	gtt. 15..30	†compos'ita,†	3 1..2
†tinctu'ra,†	3 1..2	†Clem'atis ex.†	gr. 1..3
†Chiro'nia centaur.,	3 ½..1	upright virgin's bower.	
European centaury.		†extrac'tum fl.†	3 1..2
Chlo'ral,	gr. 10..40	†Co'ca,	3 3..4
hydrate of chloral.		†extrac'tum fl.†	3 1..2
Chlorin'ii aq'ua,	3 1..4	Coc'cus,	gr. ½..10
chlorine water.		cochineal.	
†Chlor-anody'n.†	gtt. 10..30	†tinctu'ra,	gtt. 10..60
Chlorofo'r'mum,†	3 ½..1	†Cochlea'ria rad.	3 1..2
mistu'ra,†	3 ½..1	horse radish.	
spir'itus,†	3 ½..1	†extrac'tum fl.†	3 ½..1
†tinctu'ra comp.†	℥ 20..60	†syru'pus,†	3 1..4
Çimiçifuga,	3 1..3	†tinctu'ra,†	3 2..4
black cohosh.		†Codei'a,	gr. ½..1
†extrac'tum,†	gr. 4..8	Col'chicum,	gr. 2..8
flu'idum,†	3 ½..1	meadow saffron.	
†compos'itum,†	3 ½..1	†açe'tum,†	℥ 10..3 2
†tinctu'ra,†	3 1..2		
†compos'ita,†	℥ 5..60		
Çimiçifugin,†	gr. ½..6		

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extrac'tum, ‡	gr. 1..2	†tinctu'ra, ‡	3 ½..1
flu'idum, ‡	gtt. 4..12	†Corallorhi'za,	3 ½
†syru'pus, ‡	3 1..4	<small>coral or crawley root.</small>	
tinctu'ra, ‡	3 ½..2	†Cornachi'ni pul'vis,	3 ½..1
†compos'ita, ‡	gtt. 10..60	<small>Earl of Warwick's powder.</small>	
vi'nūm radi'cis, ‡	℥ 10..60	Corian'drum,	℥ 1..3
sem'inis, ‡	3 ½..2	<small>coriander seed.</small>	
†Collinso'nix ex. fl. ‡	℥ 2..15	†extrac'tum fl. ‡	3 ½ 1
<small>stone root.</small>		†Cor'nin, ‡	gr. 2..4
†tinctu'ra, ‡	gtt. 10..30	†Cor'nu us'tum,	3 1
†Collinso'nin, ‡	gr 1..5	<small>burned deerhorn.</small>	
Colocy'nthis,	gr. 5..10	†et o'pii pul'vis,	gr. 5..10
†extrac'tum, ‡	gr 1..5	†mistu'ra,	3 1..4
†compos'itum, ‡	gr. 5..10	Cor'nus,	℥ 1..3
flu'idum, ‡	gtt. 5..30	<small>dog-wood.</small>	
†Compto'nix ex fl. ‡	3 ½..2	†extrac'tum, ‡	gr 5..10
<small>sweet fern</small>		flu'idum, ‡	3 ½..2
†Conduran'go ex. fl. ‡	3 ½..1	†Coryd'alín, ‡	gr ½..1
Confectio aromát	gr. 10..60	†Coryd'alís,	gr. 10..30
Coni'i fo'lia,	gr. 3..4	<small>turkey corn</small>	
<small>poison hemlock</small>		†extrac'tum fl. ‡	gtt. 10..30
extrac'tum, ‡	gr. 2	†syru'pus comp. ‡	3 1
alcohol'icūm, ‡	gr. 1..2	†tinctu'ra, ‡	3 ½..2
flu'idum, ‡	℥ 8..5	†compos'ita, ‡	3 ½..2
fructus, ‡	℥ 5..20	Cot'ula,	3 ½..1
suc'cus,	3 1..4	<small>Mayweed, chamomile.</small>	
tinctu'ra, ‡	3 ½..1	†extrac'tum, ‡	gr. 5..20
†Contrayer'væ ra'dix,	3 ½	†flu'idum, ‡	3 ½ 1
<small>Lisbon contrayerva root.</small>		†oleum,	gtt. 5..6
†pul'vis comp.	gr. 15..30	†Cotyled onis ex ‡	gr. 5
Convalla'riæ tex. ‡	gr. 10..30	<small>navelwort, pennywort.</small>	
<small>Solomon's seal.</small>		†extrac'tum flu'idum, ‡	3 1
†ex. flu'idum, ‡	3 1..2	†suc'cus,	3 1..4
†Coavalla'rin, ‡	gr. 3..4	Creaso'tum,	gtt. 1..2
†Convol'vulus pand.	℥ 1..2	<small>creasote.</small>	
<small>wild potato or rhubarb, bindweed.</small>		aq'ua,	3 1..4
Copal'ba,	gr. 20..3 1	†mistu'ra,	3 ½..1
<small>balsam copalba.</small>		Cre'ta præpara'ta,	gr 10..30
†mistu'ra comp.	3 1	<small>prepared chalk.</small>	
oleum,	gtt. 10..15	mistu'ra,	3 ½
Copt'is,	gr. 10..30	†pul'vis comp.	gr. 20..40
<small>gold thread.</small>		†cum o'pio,	℥ 1..2
†extrac'tum fl. ‡	3 ½..1	Cro'cus,	gr. 10..30
		<small>saffron.</small>	

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## DOSE LIST.

†extrac'tum fl.†	gtt. 20.60
†tinctu'ra,†	℥ 1..3
†compos'ita,†	℥ 1..3
†syru'pus,†	℥ 1..3
†Cro'ton-chlo'ral,	gr. 5..15
Cube'ba, <small>cubeba.</small>	gr. 10..3 8
†extrac'tum,†	℥ ½..1
†flu'idum,†	℥ ½..1
†æthe'reum,†	gtt. 10..12
oleoresi'na,	gtt. 5..30
o'leum,	℥ 10..30
tinctu'ra,†	℥ 1..2
†Cumi'ni se'men,	gr. 15..60
<small>cumin seeds.</small>	
†Cuni'læ marian. ol.	gtt. 5..20
<small>dittany, stonemint, wild basil.</small>	
Cu'prum ammon	gr. ¼..(5)
<small>copper (and salts).</small>	
†carbo'nas,	gr 5
†ni'tras,	gr. ⅛..¼
†ox'idum,	gr. ¼..1
†chlor'idum,	gr. 1-16..⅛
subaçe'tas,	gr. ⅛
<small>verdigris.</small>	
sul'phas.	gr. ¼..1 [5]
<small>blue vitriol.</small>	
†Cura'ra,	gr 1-20..¾
<small>woorara.</small>	
endermically,	gr. 1-20..¾
Curcu'mæ tex. fl.†	℥ 2..3
<small>turmeric.</small>	
†Cycla'men Europ.	℥ 1..3
<small>sow bread.</small>	
Cydo'nium,	q s.
<small>quince seed.</small>	
†Cyn'aræ scol'ymi ex.	gr. 3..6
<small>garden artichoke.</small>	
†tinctu'ra,†	gtt. 30..60
Cypripe'dium,	gr. 15..60
<small>yellow ladies' slipper</small>	
†extrac'tum,†	gr. 10..15
†flu'idum,†	℥ ½..1
†tinctu'ra,†	℥ 1..3

†Cypripe'din,†	gr. ¾..3
†Citisi'na,	gr. ¾..(2)

## D.

†Damia'næ ex. fl.†	℥ ¾..1
Datu'ria,	gr. 1-100..1-60
†Delphin'ia,	gr. ½..(4)
Delphin'ii tex. fl.†	gtt. 1..2 -
<small>larkspur.</small>	
†tinctu'ra,†	gtt. 10..15
†Diascor'dium,	℥ 1..4
Digita'lis,	gr. 1
<small>foxglove.</small>	
extrac'tum,†	gr. ¼
flu'idum,†	gtt. 1..2
tinctu'ra,†	gtt. 10..20
Digitali'num,	gr. 1-60..1-30
†Dioscore'æ ex. fl.†	℥ ¾..1
<small>wild yam.</small>	
†tinctu'ra,†	gtt. 20..60
†Diosco'rein,†	gr. 1..4
Dios'pyros Virg. tex. fl.†	℥ ½..1
<small>common persimmon.</small>	
†syru'pus,†	℥ 1..4
†tinctu'ra,†	℥ 1..4
†Dip'terix odora'ta,	gr. 10..30
<small>Tonqua bean</small>	
†extrac'tum fl.†	℥ 10..30
†Dir'ca palus'tris,	gr. 6..8
<small>leather wood, rope wood.</small>	
Dracon'tium,	gr. 10..40
<small>skunk cabbage</small>	
†extrac'tum fl.†	℥ ⅓..1
†tinctu'ra,†	℥ ½..2
†Dri'mys winte'ris,	℥ 1
<small>Winter's bark.</small>	
†Dros'eræ ex. fl.†	gtt. 5..30
<small>sundew</small>	
Dulcama'ra,	℥ ½..1
<small>bitter-sweet.</small>	
extrac'tum,†	gr. 8..10
flu'idum,†	℥ ½..1

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EL.

Elate'rium,	gr. 1-16..1
squirting cucumber.	
†extrac'tum,†	gr. ½
†Elate'rin,†	gr 1-16
†Emeti'na,	gr. ⅓-[8]
†syru'pus,†	3 l.[3 3]
†Epige'æ rep. ex fl.†	3 ½..1
Mayflower, arbutus.	
†Erechthi'tes ex. fl.†	3 ½..1
fire-weed.	
to'leum,†	gtt. 5..20
Ergo'ta,	gr. 15..20
spurred rye.	
†extrac'tum,†	gr. 1..4
flu'idum,†	℥ 10..60
†æthe'reum,	℥ 10..60
†tinctu'ra,†	3 ½..2
†æthe'rea,†	3 l..1 ½
vi'num,†	3 l..3
†Ergoti'na,†	gr. ½..4
Erig'eron,	3 ½..1
fl seabane, horseweed.	
†extrac'tum,†	gr. 5..10
flu'idum,†	3 ½..1
o'leum,	gtt. 5..10
†Eryn'gium aquat.	gr. 2..3
water eryngo.	
Erythro'nium Am. gr 5..[30]	
yellow snakeleaf, dog violet.	
†Eseri'na,	gr. 1-40..1-12
eserine (from calabar bean).	
†hydrobrom.	gr. 1-40..1-12
†sul'phas,	gr. 1-40..1-12
†Eucalyp'ti fl ex.†	gtt. 15..60
Euon'ymi tex †	gr. 1..5
wahoo.	
†extrac'tum fl.†	3 ½..2
†Euon'ymin,†	gr. 1..6
†Eupato'rin.†	gr. 1..2
Eupato'rium,	gr. 20..30
boneset, thoroughwort.	
†extrac'tum fl.†	3 l..2

†Purpu'rei fl. ex.† 3 ½..1  
queen-of-the-meadow.

†Eupur'purin,† gr. 3..4  
queen-of-the-meadow.

Euphor'bia cor., gr. 1..5 [15]  
large flowering spurge.

Ipecacuan'ha, gr. 1..5 [15]  
American or wild ipecac.

†Lath'yris o'leum, gtt. 5..10  
mole (caper) plant.

F.

†Fel bovi'num, gr. 2..10  
ox gall.

tene'ma, 3 l..4

†flu'idum, ℥ 2..10

†purifica'tum, gr. 2..5

Fer'ri açeta'tis tr. ℥ 10..60  
iron (and salts).

†açeta'tis æthe'reus, 3 ½

†açe'tici tr. 3 ½..1

†albumina'tis et so'dii

syru'pus,† 3 l..2

†alkali'ni liq. 3 ½..1

†ammonia'tum, gr. 4..10

†arse'nias, gr. 1-10..⅓

†brom'idum, gr. 3..10

†elix'ir,† 3 l..2

†solu'tio,† gtt. 20

†syru'pus,† ℥ 20

†carbazo'as, gr. ½..1

†carbo'nas, gr. 5..30

†efferves'çens, 3 l..½

pil'ula,† gr. 3..10

saccha'a'tum, gr. 5..10

Vallet's mass.

†carbure'tum, gr 5..15

†chlora'ti æth. spr. ℥ 30

†chlor'idum, gr. 1..5

tinctu'ra, ℥ 10..3 2

tr. murate of iron.

tsyru'pus 3 1

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3. lias,	gr 5.10	†quin et stryck. 3 1
cellulr.†	3 1	†et am phos syr. 3 1
et ammo'nise,	gr. 5.10	†et cal'cii phos syr. 3 1
et magn'esia,	gr. 5.10	†quin et stryck. syr. 3 1
et quina lre,	gr. 5.10	pil'ule compos'ie, gr 6.12
†syrupus,†	3 1.2	†protoctris tis syr 3 1.3
†et strychnia,†	gr. 8.6	†prototart'ras, gr. 12.3
†syrupus,†	3 1	†prototrit'ris tis syr. 3 1.3
†v'mum,†	3 1.4	†protox'idi elix'ir, 3 1.4
†et zinc,†	gr. 2.5	†cincho'ne et iod'idi et
†syrupus,†	3 1.2	cal'cii elix'ir, 3 1
li quor,	℥ 10	†cincho'ne iod'idi et
terrocyani'dum,	gr. 5	cal'cii cum amon'i-
Prussian blue,		co elix'ir,† 3 1
thydrog'enus,	gr ½	pyrophos'phas, gr. 2.5
hy perchlorat'is liq. ℥ 6.10		†elix'ir,† 3 1.3
hypophos phis,	gr. 6.30	†syrupus,† 3 1.3
†syrupus,†	3 1.2	†et quin'ise,† 3 1.3
†et mangane'sii,†	3 1	†vi'num et cal'sey. 3 1.2
iod idum,	gr. 1.10	†et pru'ni Virg.† 3 1.2
li quor,	gtt. 20.30	†redac'tum, gr. 5.10
pil'ule,†	℥ 1.10	iron by hydrogen
†syrupus,†	℥ 30.40	subcarbo'nas, gr. 5.30
mo'tas,	gr. 1.20	subsulpha'tis liq. gtt. 5.10
†ucto phos. syr.†	3 1.4	Monsel's solution
†et cal'cii, mang., potas.		†suc'cinas, gr. 5.15
so dii syr.†	3 1.4	sul'phas, gr. 1.3
†mista ra aromat.†	3 1.2	green vitriol.
compos'ita,	3 1.3	†et alu'minas, gr. 5.10
nitrat'is liq'uer,	gtt. 5.30	et ammo'nise, gr. 3.15
ox alas,	gr. 2.5	ammonio-ferris albam.
ox'idum hydra'tum, 3 1.4		†et quin'ise,† gr. 1.5
arsenic antidote		exalcca'ta, gr. ½.2
†nigrum,	gr. 5.20	dried sulphate of iron.
†perac'etas,	gtt. 3.10	†granula'ta, gr. 1.5
†perchlor'idi liq.†	gtt. 5.15	†sulphure'tum, gr 5
†perox idum,	gr. 2.5	iron pyrites.
red oxide of iron.		†et potas'sii, gr. 5
phos phas,	gr. 5.10	†superphospha'tis syr. 3 1
†elix'ir,†	3 1.4	†tan'nas, gr. 5.30
		†tar'tras et am., gr. 10.30
		et potas'sii, gr. 10.30

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 4, giving Grams; Ounces by 32, giving Grams.

tet qui'nise,	gr. 3.5	†Ga'li apar'i'nis fl. ex.†	3 1.2
†valeria'nas,	gr. 1	goose grass, cleavers.	
†vi'num,†	3 1.4	Gal'la,	gr. 10..20
wine of iron.		nulgalla.	
†ama'rum,†	3 ½..1	†extrac'tum fl.†	gtt. 10..20
bitter wine of iron.		tinctu'ra,†	3 1.3
†dul'ce,†	3 ½..1	Gal'licum ac'idum,	gr. 5..20
sweet wine of iron.		Gambo'gia,†	gr. 2..10
tet car'nis,†	3 1.4	†ac'idum,	gr. 2.5
wine of beef and iron.		†pil'ulæ,	gr. 5.10
†et cincho'næ,†	3 1.4	†pul'vis comp.	gr. 15..30
Fi'lix mas,	3 1.3	†Garci'nise mang. ex.	gr. 1
male fern.		mangostine tree.	
†extrac'tum,†	gr. 9..15	Gaulthe'rise tex. fl.†	3 1.2
†æthe'reum,†	gr. 1..10	wintergreen.	
†flu'idum,†	3 1.4	o'leum,	gtt. 3..6
oleoresi'na,†	f. 3 ½	Gelse'mli ex. fl.†	gtt. 3..20
Fœnic'uli tex. fl.†	℥ 10..30	yellow jasmine.	
fennel.		†tinctu'ra,†	gtt. 10..50
o'leum,	gtt. 5..15	†Gelse'mlin,†	gr. ½..2
Frase'ra,	3 ½..1	Gentia'na,	gr. 10..30
American columbo.		†elix'ir,†	3 1.2
†Frase'rin,†	gr. 2.5	†et fer'ri chlo.†	3 1
†Frax'ini Amer.† ex. fl. 3 ½..4		†pyrophos.†	3 1
white ash.		extrac'tum,†	gr. 10..30
†Excels. sem'inis,	3 1	flu'idum,†	℥ 10..40
European ash.		†compos'itum,†	3 ½..1
†Sambuci'fol. ex.†	gr. 2..10	tr. compos'ita,†	3 1.2
black ash.		†vi'num,†	3 1.6
†flu'idum ex.†	3 1.4	†Geoffræ'a iner'mis,	3 1.2
†Fu'cus versiculo'sus, 3 ¼..2		cabbage tree.	
sea wrack, yellow bladder wrack.		†Vermifuga,	gr. 1..15
†extrac'tum fl.†	3 ½..1	arriba.	
†Fuli'go lig'ni,	gr. 3..12	Gera'nium,	gr. 10..30
wood soot.		cranesbill.	
†Fuligok'ali,	gr. 2.3	†extrac'tum,†	gr. 3..15
potassa and soot.		flu'idum,†	℥ 5..60
†Fuma'riæ offic. suc.	3 1.2	†Gera'nin,†	gr. 1.5
fumitory, juice of.		Ge'um,	3 1.3
		water avena.	
G.		†extrac'tum fl.†	3 ½..1
†Galan'ga,	gr. 15..30	Gille'nia,	gr. 2..[30]
galangal		Indian physic.	
Gal'banum,	gr. 10..30	†extrac'tum fl.†	gtt. 5..[40]
pil'ulæ comp.†	gr. 10..30		

•Reduce these doses to Metric terms by multiplying Grains or Minims by 61/2, giving Centigrams; drachms by 4, giving Grams; Ounces by 32, giving Grams. •

†Glecho'ma, ground ivy, gill.	3 ½..1	†Hamame'lis fl. ex.† witchhazel.	3 ½..2
Glyceri'na,	3 1	†Hamame'lin,†	gr. 1.5
Glycyrrhi'zæ telix'ir,† liquorice root.	3 1..2	Hedeo'mæ †fl. ex.† pennyroyal.	3 ½..1
extrac'tum,†	3 ½..1	o'leum,	gtt. 2.10
flu'idum,†	3 1..2	†Hed'erae fo'lia, English ivy leaves.	gr. 20
mistu'ra comp.†	3 ½	Helian'themi †ex.† frostwort.	gr. 2
†pul'vis comp.†	3 1..2	†extrac'tum fl.†	gtt. 5..20
Gossyp'ii fl. ex.† cotton (root).	3 1..4	†Helian'thi o'leum,†	gtt. 10..15
†infu'sum,†	3 ½..1	oil sunflower seeds.	
†tinctu'ra,†	3 1..4	Helleb'orus, black hellebore.	gr. 5..20
†Gossyp'lin,†	gr. 1.5	extrac'tum,†	gr. 5..10
Grana'ti fruct. cort. pomegranate.	3 1..2	†flu'idum,†	gtt. 5..20
radi'cis cort.	3 1..2	†pil. et myr'rhae,†	gr. 4..8
†flu'idum ex.†	gtt. 10..40	tinctu'ra,†	3 ½..1
†Grati'ola officin. hedge hyssop, herb of grace.	gr. 15..30	†vi'num comp.†	3 ½..2
†Grinde'liæ rob. elix.†	3 1..4	†Helminthocor'ti pulv.†	3 1..3
†extrac'tum,†	gr. 3..6	Corsican worm moss.	
†flu'idum,†	3 ½..1	†Helonia'tis elix.† false unicorn.	3 1..2
†Squar'rosæ fl. ex.†	gr. 3..10	†elix. compos'itus,†	3 1
Gua'iaqi lig'ni †fl. ex.†	3 1..2	†extrac'tum fl.†	3 ½..1
†mistu'ra,†	3 ½..1	†Hel'onin,†	gr. ½..4
resi'na,†	gr. 10..30	†Hemides'mi syr. Indian sarsaparilla.	3 1
tinctu'ra,†	3 1..4	Hepat'icæ †ex. fl.† liverwort.	3 1..2
ammonia'ta,†	3 1..2	†Heracle'um lanatum,† masterwort, cow parsnep.	3 1..3
†Guara'næ,†	3 ½..2	Heu'chera, alum root, cliff weed.	gr. 5..20
†elix'ir,†	3 1..2	†Hiera'cii infus. hawk weed.	3 1..2
†extrac'tum †	gr. 3..6	†syru'pus,†	3 1..2
†flu'idum,†	3 ½..2	†Hippu'ris vulg. ashes of scouring rush.	gr. 3..10
Gutta-per'chæ liq. external		Hu'mulus, hops.	gr. 3..60
†Gymnoc'eladi tr. Kentucky coffee tree.	gtt. 2..6	†elix'ir,†	3 1..2
		†extrac'tum,†	gr. 3..20
		†flu'idum,†	3 ¼..1
		tinctu'ra,†	3 1..3

## H.

Hæmator'ylli ex. logwood.	gr. 10..30
†extrac'tum fl.†	3 ½..1

Reduce these doses to Metric terms by multiplying Grains or Minims by 6½, giving Centigrams; drachms by 4, giving Grams; Ounces by 32, giving Grams.

Dose List.

19

†Hydran'geæ fl. ex.†	3 1..2	†Hydras'tin alkal.†	gr. ¼..3
wild hydrangeæ, blæssum.		†neutral princip'l,†	gr. 1..6
Hydran'gyri †açe'tas, gr. ⅙..1		Hydras'tis †ex.†	gr. 2..5
mercury (and salts).		golden seal.	
ammonia'tum, external		extrac'tum fl.†	gtt. 20..30
white precipitate.		†tinctu'ra,†	gtt. 10..60
†bibrom'id. gr. 1-20..1-12		†vi'num comp.†	3 ½..2
†bo'ras, gr. 2		†Hy'drogen perox'id. 3 1..4	
†protobrom'idum, gr. 1..4		oxygenated water.	
chlor'idum cor. gr. 1-16..⅙		Hyoscy'ami fo'lia, gr. 5..10	
corrosive sublimate.		henbane.	
mi'te, gr. 1..20		extrac'tum,†	gr. 2..6
calomel.		alcohol'icum,†	gr. 1..2
†biniod'id., gr. 1-16..¼		flu'idum,†	℥ 5..10
†pil'ulæ et o'pii, No. 1		tinctu'ra,†	3 ¼..1
cum cre'tâ, gr. 2..30		†Hyoscy'a'mia, gr. 1-60..1-20	
with chalk.		†Hyoscy'amin,†	gr. ⅙..1
cyan'idum, gr. 1-16..⅙		†Hyper'ici perf. ex. fl.† 3 ½..1	
tet qui'nisæ chlor. gr. 1		St. John's wort.	
iod'idum †flav. gr. ⅙..¼		†tinctu'ra, 3 ½..1	
yellow iodide.		†Hypophos'phium syr.† 3 1..2	
rub'rum, gr. 1-16..¼		syrup hypophosphites.	
red iodide.		†syru'pus comp.† 3 1..2	
vir'ide, gr. ¼..3		†Hysso'pi fl. ex.† 3 1..2	
green iodide.			
†ni'trici lq. gtt. 2..3			
tox'idum nig. gr. ¼..1			
black oxide.			
toxymu'rias, gr. 1-16..⅙			
†li'quor, 3 ½..1			
†phos'phas, gr. ½..1			
pil'ulæ,† gr. 5..15			
blue pill.			
†compos'itæ, gr. 10..20			
†scam. et al'oës,† gr. 8..30			
†protonitra'tis lq. gtt. 3			
†subox'idum, gr. ¼..1			
black oxide.			
sul'phas fla'va, gr. ¼..[3]			
turpeth mineral.			
†sulphure't. nig. gr. 5..30			
Ethiop's mineral.			
rub'rum, gr. 5..30			
cinnabar, vermilion.			

I.

†Ibe'ris ama'ra, gr. 1..3	
bitter candytuft.	
Ignat'ia, gr. ¼..1	
St. Ignatius's bean.	
extrac'tum †	gr. ⅙
†flu'idum,†	gtt. 2..10
†tinctu'ra,†	gtt. 5..10
†I'lex, 3 ¼..3	
belly.	
†In'digo, 3 1..3	
In'ula, 3 1..3	
elecampene.	
†extrac'tum fl.† 3 ¼..1	

Reduce these doses to Metric terms by multiplying Grains or Minims by 6½, giving Centigrams; drachma by 4, giving Grams; Ounces by 32, giving Grams.





†Lactu'cæ ex.† garden lettuces.	gr. 5..10	†Li'num catharti'cum, 3 1 purg'g flax.
Lactuca'rium ex.† juice of garden lettuce.	gr. 1..10	†extrac'tum,† gr. 4..8
†extrac'tum fl.†	3 ½..1	†Liquidam'bar syru'pus, 3 1 sweet gum.
syru'pus,†	3 2..3	†Lirioden'drin,† gr. 5..10
†tinctu'ra,†	3 ½..1	Lirioden'dron, 3 ½..2 poplar, whitewood.
Lap'pa, burdock.	3 1	†extrac'tum fl.† 3 1..2
†extrac'tum,†	gr. 7..20	†tinctu'ra,† 3 1
flu'idum,†	3 ½..1	Lith'i carbo'nas, gr. 3..6 lithium (and salts).
†syru'pus,†	3 ½	†brom'idi, gr. 5..30
†Lar'icis Amer. fl. ex.† 3 ½..1 tamarac bark.		†i'tras, gr. 5..10
†Lauri ex. fl. c.† gtt. 15..60 spicewood berries, comp. fl. extract.		†elix'ir,† 3 1..2
†Laurocer'asi aq. 3 ½..1		Lobe'lia, gr. 1.3 [20] Indian tobacco, emetic weed.
Lavan'dulæ o'leum, gtt. 5 lavender.		ace'tum, 3 ½..[4]
spir'itus,† 3 ½..1		†extrac'tum † gr. ½..[2]
compos'itus,† 3 ½..1		†æthe'reum,† gtt. ½..[1]
†Leonu'ri ex.† gr. 3.6 motherwort.		†flu'idum,† 3 ¼..[1]
†extrac'tum fl.† 3 ½..1		†compos'itum,† 3 ¼..[1]
†pil'ulæ comp.,† No. 1		to'leum, gtt. ½..[1]
Leptan'dra, 3 ½..1 Culver's root.		†syru'pus,† 3 1..4
†extrac'tum,† gr. 2..4		tinctu'ra,† 3 ½..[2]
†flu'idum,† ℥ 20..60		†æthe'rea,† 3 ½..[2]
†tinctu'ra,† 3 ½..2		†compos'ita,† gtt. 10..30
†Leptan'drin,† gr. ½..2		†et cap'sici,† [3 ½..1]
†Li'atrin,† gr. 1..5		†Lobe'lin,† gr. ½..[1]
†Lia'tris ex. &† 3 ½..1 deer tongue, button snakeroot.		†Lu'puli ex.† gr. 10..30
†Limo'nis o'leum, gtt. 2..6 lemon.		Lupuli'na,† hops. lupulin.
spir'itus,† 3 ½..2		†elix'ir,† 3 1..2
†uc'cus, 3 ½..1		extrac'tum fl.† ℥ 10..15
syru'pus,† 3 ½..1		†compos'itum,† ½..1
†Ligus'tici fl. ex.† 3 ½..1 lovage.		tinctu'ra,† 3 1..2
†Ligus'tri fo'lia, 3 1..2 privet.		†Lyco'pi fl. ex.† 3 ½..1 bugleweed.
		†tinctu'ra,† ℥ 5..60
		†Lyc'opin,† gr. 1..5
		†Ly'thrum salica'ria, 3 ½..1 lo.-se-strife, purple willow herb.

Reduce these doses to Metric terms by multiplying Grains or Minims by 6¼, giving Centigrams; drachms by 4, giving Grams; Ounces by 32, giving Grams.

## M.

Ma'cis, <small>mace (nutmeg).</small>	gr. 5..20	†lacto-phosph. syr.†	3 1..2
†extrac'tum fl.†	℥ 5..20	†ox'idum nig.,	gr. 3..20
Magne'sia,	gr. 10..60	sul'phas,	gr. 5..3 2
Magne'sii taçetat. syr.	3 1..6	Man'na,	3 1..8
†bisul'phis,	gr. 15..60	Maran'ta,	3 1..3
carbo'nas,	3 ½..1	<small>arrow root.</small>	
†pondero'sa.	3 ½..1	Marru'bium,	gr. 30..60
†liq'uor,	3 1..2	<small>horehound.</small>	
†chlor'idum,	3 1..4	†extrac'tum,†	gr. 10..15
çitra'tis liq.	3 6..12	†flu'idum,†	3 ¼..1
†et pot. borotart.,	3 1	†suc'cus,	3 1
†hyposul'phis,	gr. 15..60	†syru'pus comp.	3 ½
†lacto-phosph. syr.†	3 1..4	Mas'tiche,	gr. 10..30
†pul'vis comp.	3 1	<small>mastic.</small>	
†sili'cas,	gr. 30..60	Mati'co, [tee'co]	3 ¼..2
sul'phas,	3 ½..2	<small>soldier's weed.</small>	
<small>epsom salt.</small>		extrac'tum fl.†	3 ½..1
†sul'phis,	3 ½..2	†tinctu'ra,†	3 1..8
†sulphure'tum,	gr. 5..30	Matrica'riæ tex.†	3 ¼..1
Magnolia,	3 ¼..2	<small>German chamomile.</small>	
<small>magnolia, swamp sassafras.</small>		†extrac'tum fl.†	3 ¼..1
†tinctu'ra,	3 1..4	Mel,	q. s.
†Mallo'tus (see Rottlera).		<small>honey.</small>	
†Malt extrac'tum fl.	3 2..4	Melis'sa,	<i>Inf's.</i>
†cum hypophosph.	3 2..4	<small>balm.</small>	
†cum fer'ri et manganè-		†Menisper'mi ex. fl.†	3 ½..1
sii iod'idi,	3 2..4	<small>yellow parilla.</small>	
†cum fer'ri et quin.çit.	3 2..4	†tinctu'ra,†	3 ½..1
†ferra'tum,	3 2..4	†Menisper'min,†	gr. 2..6
†with alteratives,	3 2..4	Men'thæ pip. tex. fl.†	3 1..2
Manganè'sii taçetas,	gr. 5	<small>peppermint.</small>	
†binox'idum,	gr. 3..20	o'leum,	gtt. 1..5
†carbo'nas,	gr. 5	spir'itus,†	gtt. 5..40
†chlor'idum,	gr. 5	Vir'idis tex. fl.†	3 1..3
†hypophosphi'tis syr.†	3 1	<small>spearmint.</small>	
†iod'idum syr.†	℥ 10..30	o'leum,	gtt. 1..6
†et fer'ri syr.†	℥ 10..30	spir'itus,†	gtt. 10..60
†las'tas,	gr. 1..5	†Menyan'thes trifol.	gr. 20..30
		<small>buckbean, marsh trefoil.</small>	
		†extrac'tum,	gr. 5..10
		Meze'reum,	gr. 10
		†extrac'tum fl.†	gtt. 5..20
		†Mistu'ra alterant. c.	3 ½..1
		<small>compound tonic mixture.</small>	
		†olei compos'ita,	3 1
		<small>compound mixture of oils.</small>	

face these doses to Metric terms by multiplying  
 ' or Minims by 6½, giving Centigrams; drachms by  
 ---g Grams; Ounces by 32, giving Grams.

# Dose List.

23

†Mitchellæ rep. fl. ex. †	3½-1
partridge berry.	
†ex. fl. comp. †	gtt. 30-60
†syru'pus comp.	3 2-4
†Momor'dicæ bals ex. gr. 6-15	
balsam apple.	
Monar'da,	<i>Inf.</i>
horsemint.	
o'leum,	gtt. 1-3
†Mone'siæ,	gr. 12-40
†extrac'tum,	gr. 2-10
†Mon'esin,	gr. ½
†Monot'ropæ rad.	3 ¼-1
corpse or ice plant, Indian pipe.	
†Mo'ri suc'cus,	3 1-4
mulberry juice.	
†syru'pus,	3 ½-1
Mor'phia,	gr. ⅛-½
ace'tas,	gr. ⅛-½
†syru'pus, †	3 ½-1
†çi'tras sol. †	gtt. 10
mu'rias,	gr. ⅛-¾
†syru'pus, †	3 ½-1
sul'phas,	gr. ⅛-¾
commercial morphine.	
†syru'pus, †	3 ½-1
liq'uor,	3 1
†Magen'dis,	℥ 5
†valeria'nas,	gr. ⅙-¾
Mor'rhuæ o'leum,	3 ½
cod-liver oil.	
†emul'sio,	3 1-2
†terra'ta,	3 ½-1
†ioda'ta,	3 ½-1
†iodoferra'ta,	3 ½-1
†cum hypophos. cal'cli	
et so'dii,	3 ½-1
†cum lactoph. cal'c.	3 ½-1
†cum phosph. cal'c.	3 ½-1
†cum quin'ia,	3 ½-1
Mos'chus,	gr. 10
†mistu'ra, †	3 ½-2
musk.	

†tinctu'ra, †	3 1-4
†Foeti'tias,	gr. 10
artificial musk.	
†tinctu'ra,	3 1
Mucu'na,	3 1
cowhage.	
†Myri'cæ,	gr. 20-50
bayberry.	
†extrac'tum fl. †	3 ½-1
†Myr'için, †	gr. 2-10
Myris'tica,	gr. 5-20
nutmeg.	
†extrac'tum fl. †	℥ 5-20
o'leum,	gtt. 2-3
spir'itus, †	3 1-2
Myr'rha,	gr. 10-30
myrrh.	
†extrac'tum fl. †	℥ 10-30
†pul'vis comp.	gr. 15-60
tinctu'ra, †	3 ½-1
†compos'ita, †	3 ½-1

## N.

†Narcel'a,	gr. ¼-¾
from opium.	
†Narcis'sus pseudo,	[3 1-6]
daffodil.	
†extrac'tum,	[gr. 2-3]
Nectan'dra,	gr. 2-5
bebeera bark.	
†Nic'coli sul'phas,	gr. ¼-1
nickle sulphate.	
†Nicoti'na,	gr. 1-60
nicotin (from tobacco).	
†Nitroglyce'ri'na,	gtt. 1-40 (2)
Nux vom'ica,	gr. 2-5
poison nut.	
extrac'tum, †	gr. ¼-2
flu'idum, †	gtt. 5-15
tinctu'ra, †	gtt. 5-20
†Nymphæ'æ od. ex. fl. †	3 ½
white peon-lily.	

•Reduce these doses to Metric terms by multiplying Grains or Minims by 64, giving Centigrams; drachms by 4, giving Grams; Ounces by 32, giving Grams.

## O.

†Enan'the phelland.	gr. 5
fine-leaved water hemlock.	
†extrac'tum,†	gr. 2.5
†tinctu'ra,†	3 ½..1
†Ænothe'ræ fl. ex.†	3 ½..1
evening primrose.	
†Olei compos'ita mist.	3 1
vermifuge oil mixture,	
†Oleum phosphor. gtt.	5..15
phosphorated oil.	
†sulphura'tum,	gr. 5..30
sulphurated oil.	
†Olib'anum,	gr. 15..60
frankincense tree.	
Oli'væ oleum,	3 1..2
olive oil.	
†Opop'anax,	gr. 10..30
Orig'ani oleum,	gtt. 1..4
wild marjoram.	
†Opian'ia,	gr. 1-60..1-30
O'pium,	gr. ½..1
acē'tum,†	℥ 3..7
confec'tio,	gr. 15..30
extrac'tum,†	gr. ¼..½
flu'idum,†	gtt. 10..40
†deodora'tum,†	℥ 5..20
†pil'ulæ,†	No. 1..2
tet plum'bi acet.	gr. 3..5
†pulv. comp.†	gr. 5..10
tinctu'ra,†	℥ 6..13
laudanum.	
acē'ta'ta,†	℥ 5..10
†ammonia'ta,†	℥ 30..60
camphora'ta,†	3 ½..2
paregoric.	
deodora'ta,†	℥ 6..13
vi'num,†	℥ 6..13
†Oroban'che Virg.	gr. 10..15
beech drops, cancer root.	
†Osmun'dæ fl. ex.†	3 1..2
buckhorn, flowering fern.	
†Os'tryæ Virg. ex. fl.†	3 1
iron-wood.	

## P.

†Paramor'phia,	gr. 1-60..1-30
from opium.	
†Pæo'nia officina'lis,	3 1..2
peony.	
†suc'cus,	3 1
Pa'nax,	gr. 10..60
ginseng.	
†Papaveri'na,	gr. ½..1
from opium.	
Papav'eris tēx.†	gr. 5..10
poppy.	
†extrac'tum fl.†	gtt. 10..40
†syru'pus,†	3 ½..1
Parei'ra,	gr. 30..60
†extrac'tum,†	gr. 10..30
flu'idum,†	3 ½..1
†tinctu'ra,†	3 1
†Parthe'nii fl. ex.†	3 1..2
Pe'po,	3 1..2
pumpkin seed.	
†extrac'tum fl.†	3 ½..2
†Pepsi'na,†	gr. 2..20
pepsin.	
†elix'ir,†	3 1..4
tet bismu'thi,†	3 1..4
tet quin'ia,†	3 1..4
tet strych'niæ,†	3 1..2
†strych. et bis.†	3 1..2
†strych. bismu'thi et	
fer'ri,†	3 1..2
†essen'tia,†	3 1
†glyceri'tum comp.†	3 1..2
†liq'uida,†	3 1
†vi'num,†	3 1..4
Peruvia'num bals.†	3 ½
Peruvian balsam.	
†Petro'leum,	gtt. 10..30
Petroseli'num,	gr. 8..15
parsley.	
†oleoresi'na,	gtt. 5..6
apiol.	

Reduce these doses to Metric  
 measures or Minims by 6½, giving  
 Grams; Ounces by 32

Ang.

†Phloridzi'na, bitter principle of apple, pear, etc.	gr. 5..15	Pix liq'uida, common tar.	5 ½..1
Phos'phorus,	gr. 1-35..1-20	glyceri'tum,†	3 ½..1
telix'ir,†	3 1.2	†syru'pus,†	3 2..4
†oleum phosph.†	gtt. 1..10	†vi'num,†	3 1..3
†tinctu'ra,†	gtt. 1..2	†Plantag'inis fl. ex.†	3 ½..1
†Phospha'tium syr.†	3 1..2	plantain.	
compound syrup phosphates.		†Plati'ni bichlor'id.	gr. ½..2
†Phy'salis suc'cus,	3 1..2	bichloride of platinum.	
ground cherry.		Plum'bi açe'tas,	gr. 1.8
Physostig'ma,	gr. 2..3	sugar of lead.	
calabar bean.		iod'idum,	gr. ¼..3
extrac'tum,†	gr. 1-16..½	ni'tras,	gr. ¼..¼
†flu'idum,†	gtt. 1..3	†ox'idum,	gr. 2..5
†tinctu'ra,†	gtt. 5..10	Podophyl'lum,	gr. 10..20
Phytolac'cæ bac'cæ †tr.†	3 1	may-apple, mandrake.	
poke (berry).		extrac'tum,†	gr. 5..15
Radi'cis,	gr. 1..15	†flu'idum,†	gtt. 10..50
garget, poke (root).		†compos'itum,†	3 ½..2
†extrac'tum,†	gr. 1..[6]	resi'na,	gr. ¼..1
†flu'idum,†	gtt. 10..[30]	podophyllin.	
†syru'pus comp.†	3 1	†tinc'tura,†	gtt. 10..63
†tinctu'ra,†	3 ½..1	†Polemo'nii tr.	3 1..2
†vi'num comp.†	3 ½..1	Greek valerian.	
†Phytolac'cin,	gr. ¼..1	Polyg'ala rubel'la,	gr. 3..30
†Picrotoxi'na,	gr. 1-20..1-20	bitter polygala.	
from cocculus indicus.		†Polyg'oni ex.†	gr. 4..6
†Pilocarpi'na,	gr. 1-12..¼	smartweed, water pepper.	
from jaborandi.		†extrac'tum fl.†	3 ½..¼
Pimen'ta,	gr. 10..40	†tinctu'ra,†	3 1
allspice.		†Polym'niæ u. fl. ex.†	gtt. 3
†extrac'tum fl.†	℥ 5..40	bearsfoot.	
o'leum,†	gtt. 3..6	†Polypo'dium,	3 1..4
†tinctu'ra,†	3 1..2	†Pop'uli fl. ex.†	3 ½..1
†Pimpinell'a saxif.	3 ½	balm of Gilead.	
†Pi'ni Canad. fl. ex.†	3 1..2	†Tremuloi'des,	3 1
hemlock.		American poplar.	
Pi'per,	gr. 5..20	†Pop'ulin,†	gr. 4..8
black pepper.		†Por'ri suc'cus,	3 1
†confec'tio,	3 1..2	leek.	
†extrac'tum æth.†	gtt. 1..4	Potas'se liq'uor,	℥ 10..30
†flu'idum,†	℥ 5..20	Potas'sii açe'tas,	3 1..3
oleoresi'na,†	℥ 1..2	†antimo'niæ,	gr. ½..1
piperin.		arseni'tis liq'uor,	gtt. 5..10
†Pi'perin,†	gr. 1..8	Fowler's solution.	
(Eclectic preparation.)		bicarbo'nas,	3 1..2

Reduce these doses to Metric terms by multiplying Grains or Minims by 64, giving Centigrams; drachms 4, giving Grams; Ounces by 32, giving Grams.

# DOSE LIST.

bichro'mas,	gr. $\frac{1}{8}$ [34]	tar'tras,	3 1.8
†binox'alas,	gr. 1..(4)	cream of tartar,	
†bisul'phas.	3 1.2	et so'dii,	3 $\frac{1}{2}$ -1
†bisul'phis,	gr. 15..60	Rochelle salts.	
bitar'tras,	3 1.8	Pri'nos,	3 1.3
†boracio-tar'tras,	3 1.2	black alder.	
brom'idum,	gr. 5..20	†extrac'tum fluid.†	3 1.2
†glyceri'tum,†	3 $\frac{1}{2}$ ..1	†Propyla'mia,	gtt. 1.2
†elix'ir,†	3 1.2	†mu'rias,	gr. 3..5
†carbazo'tas,	gr. 2.5	†Pru'nin,†	gr. 2..6
carbo'nas,	gr. 10..80	Pru'nus Virginia'na,	3 1.3
pu'ra,	gr. 10..30	wild cherry.	
chlo'ras,	gr. 10..30	extrac'tum fl.	3 1.2
†glyceri'tum,	3 $\frac{1}{2}$ ..2	†compos'itum,†	3 $\frac{1}{2}$ ..1
trochis'ci,	No. 1..6	tvi'num,†	3 1.2
†chro'mas,	gr. $\frac{1}{4}$ ..[2..4]	†et fer'ri pyrophos.	3 1.2
ci'tras,	gr. 15..25	syru'pus,	3 $\frac{1}{2}$ ..2
liq'uor.	3 $\frac{1}{2}$	†Psora'leæ egland. tr.	3 3.6
mistu'ra,	3 $\frac{1}{2}$	congo root.	
cyan'idum,	gr. $\frac{1}{2}$	†Pte'leæ ex. fl.†	gtt. 10..40
ferrocy'an'idum,	gr. 10..15	wafer ash, swamp dogwood.	
hypophos'phis,	gr. 10..80	†tinctu'ra,	3 1.3
†hyposul'phis,	gr. 15..60	†Pte'lein,†	gr. 1..5
ti'odas,	gr. 5..10	†Pulmona'riæ ex. fl.†	3 $\frac{1}{2}$ ..1
iod'idum,	gr. 5..15	lung wort.	
†et hydrar'g.	gr. 1-40.. $\frac{1}{4}$	†Pulsatill'æ ex. fl.†	gtt. 1..5
†et fer'ri syr.	3 1	†tinctu'ra,†	3 1
†lacto-phospha'tis syr.†	3 1	Pyreth'rum,	3 1.3
ni'tras,	gr. 10..80	pellitory.	
salt petra.		†tinctu'ra.	3 1
perman'ganas,	gr. $\frac{1}{2}$ ..1	†Parthe'nii ex. fl.†	3 $\frac{1}{2}$ ..2
†phos'phas,	gr. 10..30	fever few.	
†pi'cras,	gr. 2..5		
†sil'icas,	gr. 10..15		
soluble glass.			
sul'phas,	3 1.6		
†pul'vis comp.	3 1.3		
sul'phis,	gr. 15..60		
sulphure'tum,	gr. 2..10		

Q.

Quas'sia,	3 1.2
extrac'tum,†	gr. 5
†flu'idum,†	3 $\frac{1}{2}$ ..1
tinctu'ra †	3 1.2
†compos'ita,†	3 1.2
Quer'cus,	3 1.3
black (also white) oak.	
†extrac'tum,†	gr. 10..20
†flu'idum,†	3 $\frac{1}{2}$ ..1

Reduce these doses to Metric terms by multiplying Grains or Minims by 64, giving Centigrams; drachms by 4, giving Grams; Ounces by 32, giving Grams.

†Quilla'yæ sapo. ex. fl. ext.  
soap tree bark.

Quin'ia,	gr. 1.20
†açe'tas,	gr. 1.20
†antimo'nias,	gr. 2..20
†arse'nias,	gr. $\frac{1}{3}$
†brom'idum,	gr. 5..15
†felix'ir,	℥ 1..6
†bromohy'dras,	gr. 1..10
†çi'tras,	gr. 1..6
†extrac'tum,†	gr. 6..24
†ferrocy'anas,	gr. 1..3
†gal'las,	gr. 1..20
†hydri'odas,	gr. 1..3
†hydrobro'mas.	gr. 1..3
†hydroferrocy'anas,	gr. 1..3
†hypophos'phis,	gr. 1..6
†iodosul'phas,	gr. $\frac{1}{2}$ ..3
Herapath's salt.	
†ki'nas,	gr. 1..6
†lac'tas,	gr. 1..6
†mu'rias,	gr. 1..20
†phos'phas,	gr. 1..6
†salicy'las,	gr. 1..10
sul'phas,	gr. 1..20
commercial quinine.	
†fer'ri et magnes.	gr. 1..6
†glyceri'tum,	℥ 1..3
†cum strych'nia,	℥ 1
pil'ulæ,	No. 1..6
†sulphocarbo'las,	gr. 1..3
†syru'pus,	℥ 1..3
†tinctu'ra,	℥ 1..6
†compos'ita,	℥ $\frac{1}{2}$
†tan'nas,	gr. 1..20
†u'ras,	gr. 1..3
valeria'nas,	gr. 1..2
†felix'ir,†	℥ 1
†Quinid'iae sulph.	gr. 3..15
†Quinoid'ia,	gr. 1..6

## R.

†Rhamni cath. fl. ex.†	℥ $\frac{3}{4}$ ..1
buckthorn berries.	
†Frang'ulæ ex. fl.†	℥ $\frac{1}{2}$ ..2
buckthorn bark.	
†syru'pus,†	℥ $\frac{1}{2}$ ..2
Rhe'um,	gr. 5..20
rheubarb.	
extrac'tum,†	gr. 5..20
flu'idum,†	℥ 5..20
aromaticum,†	℥ $\frac{1}{2}$ ..1
†et potass.†	℥ $\frac{1}{4}$ ..1
†et sen'næ,†	℥ $\frac{1}{2}$ ..1
pil'ulæ,	No. 1..6
compos'itæ,	No. 1..6
†et fer'ri,	No. 2..3
pul'vis compos.	gr. 5..60
syru'pus,†	℥ $\frac{1}{4}$ ..2
aromat'icus,†	℥ $\frac{1}{2}$ ..1
†compos'ita,†	℥ $\frac{1}{2}$ ..2
†et potas'sii comp.†	℥ 2
et sen'næ,†	℥ $\frac{1}{4}$ ..2
tinctu'ra,†	℥ $\frac{1}{2}$
†compos'ita,†	℥ $\frac{1}{2}$ ..1
†et al'oës,†	℥ 1..6
†et gentia'næ,†	℥ 1..6
et sen'næ,†	℥ 1..6
vi'num,†	℥ 1..4
†Rhe'adis syru'pus,	℥ 1
red poppy.	
Rhos gla'bri†ex. fl.†	℥ 1..2
sumach.	
†Toxicodend. ex. fl. ℥	1..6
poison oak.	
†Rhu'sin,†	gr. 1..2
from sumach.	
†Ric'ini fl. ex.†	℥ $\frac{1}{2}$ ..1
castor oil bean.	
o'leum,†	℥ $\frac{1}{4}$ ..2
Ro'sæ a'qua,	q. s.
rose-water.	
confec'tio,	q. s.
infu'sum comp.	℥ 1..4

Reduce these doses to Metric terms by multiplying Grains or Minims by  $6\frac{1}{2}$ , giving Centigrams; drachms by 4, giving Grams; Ounces by 32, giving Grams.



mel,	q. s.	†Sagape'num,	gr. 10.30
honey of roses.		Sa'lix,	gr. 1.30
syru'pus,†	3 ½.2	willow.	
Rosmari'nus,	gr. 10.30	†Sali'ci'num,	gr. 2.3
rosemary.		salicls.	
o'leum,	gtt. 2.6	Sal'via tex. fl.†	3 ½.1
Rottle'ra,	3 1.3	sage.	
kameela.		Sambu'ci tex.†	gr. 3.10
†extrac'tum,†	gr. 4	elder.	
†tinctu'ra,†	3 1.3	†extrac'tum fl.†	gtt. 1.2
Ru'bia,	3 ½	†vi'num,	3 2
madder.		Sanguina'ria,	gr. 1.[15]
Ru'bus,	gr. 20.30	blood root.	
black berry.		açe'tum,	℥ 5.[3 2]
†extrac'tum,†	gr. 4.6	†extrac'tum,†	gr. ½.[5]
flu'idum,†	3 ½.1	†flu'idum,†	℥ 1.[15]
syru'pus,†	3 ½.2	†m'stu'ra comp.†	3 ½.1
†Strigo'si fl. ex.†	3 ½.1	†syru'pus,†	gtt. 10.60
red raspberry.		†tinctu'ra,†	℥ 10.[60]
Rum'icis cris'pus†ex.	gr. 4.8	†açeta'ta comp.	[3 1.4]
yellow dock.		†compos'ita,	[3 1.4]
†extrac'tum fl.†	3 ½.1	†Sanguina'rin,†	gr. 1-12.[1]
†syru'pus,†	3 1.4	†Sanguinari'næ sul'phas,	
†Açetose'l'æ ex. fl.†	3 ½	gr. 1-30.[1]	
common field sorrel.		†Sanic'ula Marilandica,	3 ½
†Rum'ic'in,†	gr. 2.5	sanicle, black snakeroot.	
from yellow dock.		†San'tali ex. fl.†	3 ½.2
Ru'ta,	gr. 15.30	sandlewood.	
rue.		†o'leum,†	℥ 20.40
†extrac'tum,†	gr. 2.4	Santon'ica,	gr. 10.30
†flu'idum,†	gtt. 20.40	Levant wormseed.	
o'leum,	gtt. 2.5	Santoni'num,	gr. 2.3
		santonin.	
		trochis'ci,	No. 1.6
		†Sao'ria,	3 1
		Sa'po (duras),	gr. 5.3)
		hard soap.	
		†mol'lis,	external
		soft soap.	
		†vir'idis,	external
		green soap.	
		†Sarraçe'nia,	3 ½
		fly trap plant.	
		†extrac'tum fl.†	℥ 10.30
		pitcher plant.	
		†tinctu'ra,†	3 1

*Reduce these doses to Metric terms by multiplying Grains or Minims by 61/2, giving Centigrams; drachms by 4, giving Grams; Ounces by 32, giving Grams.*

## DOSE LIST.

29

Sarsaparilla,	3 ½.1	†Scutella'rin,†	gr. 1.5
†extrac'tum,†	gr. 5..20	†Seli'num palus'tre, gr.20..30	
†compos'itum,†	gr. 5..20	marsh parsley.	
flu'idum,†	3 ½.1	†Sen'eçin,†	gr. 1.5
compos'itum,†	3 ½.1	†Seneçio'nis fl. ex.†	3 ½.1
tet tarax'açi,†	3 1	life-root, golden ragweed.	
†syru'pus,	3 1.4	Sen'ega,	gr. 10..20
compos'itus,†	3 ½	seneka snakeroot.	
Sas'safras tex. fl.†	gtt. 30..60	extrac'tum,†	gr. 1..3
o'leum,	gtt. 2..3	flu'idum,†	gtt. 20..40
†tinctu'ra,†	gtt. 10..30	syru'pus,	3 ½.2
†Sature'jæ hort. ex. fl.†	3 1.2	†tinctu'ra,†	3 ½.2
summer savory.		Sen'na,	3 ½.2
Scammo'nium,	gr. 5..30	consec'tio,	3 2
scammony.		†compos'ita,	gr. 10..16
†consec'tio,	3 ½.1	†extrac'tum,†	gr. 3..8
†mistu'ra,†	3 ½.2	flu'idum,†	3 1.4
†pulvis antimo'nial.	3 ½.1	†compos'itum,†	3 ½.1
†compos'itus,†	gr. 10..30	†et jala'pæ,†	3 ½.1
†cum al'oë,	gr. 10..15	†mistu'ra comp.	3 1.2
†hydrarg.sulph.nig.	3 1.2	†pul'vis comp.	3 ½.1
res'i'na,†	gr. 4..8	†scam. et lig'ni comp.	3 1
†syru'pus,†	3 1.4	†syru'pus,†	3 ½.1
Scil'la,	gr. 1..2	†tinctu'ra,†	3 2..8
squilla.		†compos'ita,†	3 1.8
açe'tum,	℥ 15..60	et rhe'i,†	3 1.6
extrac'tum fl.†	gtt. 10..30	†et jala'pæ,†	3 4..8
†compo'situm,†	gtt. 10..20	Serpenta'ria,	gr. 10..30
pil'ulæ comp.†	gr. 10..20	Virginia snakeroot.	
syru'pus,	3 ½.1	extrac'tum fl.†	℥ 20..30
compos'itus,	3 ½.[2]	tinctu'ra,†	3 1.2
hive syrup.		†compos'ita,†	gtt. 10..60
tinctu'ra,†	℥ 10..20	Ses'ami o'leum,	3 ½.1
Scoopa'ria,	gr. 10..15	benne oil.	
†extrac'tum,†	3 ½.1	†Sil'phii ex. fl.†	3 ½.2
†flu'idum,†	gtt. 15..40	rosin weed.	
†suc'cus,	℥ 30..60	Simaru'ba,	3 1.3
Scutel'larisæ tex.	gr. 2..10	Sina'pis,	[3 1.2]
scullcap.		mustard.	
tex. flu'idum,†	3 1.2	o'leum,	gtt. 1-12th
†compos'itum,†	3 ½.1	So'dæ liq'uor,	gtt. 10..30
		liq. chlorina'tæ,	℥ 10..60

Reduce these doses to Metric terms by multiplying Grains or Minims by 64, giving Centigrams; drachms by 4, giving Grams; Ounces by 32, giving Grams.

So'dii ace'tas, sodium (and salts).	℥ 1.6	Solidag'inis tex. fl.† golden rod.	℥ 1.6
arse'nias,	gr. 1-12.½	†Spar'tium, Spanish broom.	gr. 10..15
liq'uor,	℥ 3.5	Spige'lia, pinkroot.	gr. 10..60
†benzo'as,	gr. 10..30	extrac'tum fl.†	℥ 10..60
bicarbo'nas,	gr. 10..60	†compos'itum,†	℥ ½..2
trochis'ci,	No. 1..6	et sen'næ,†	℥ ½..1
†bisul'phis,	gr. 15..60	Spiræ'æ tex. hard hack.	gr. 5..15
bo'ras,	gr. 5..40	†extrac'tum fl.†	℥ ½..1
glyceri'tum,	℥ ½..2	Spir'itus frumen'ti, whiskey.	℥ 1..8
mel,	℥ ½..6	†Myr'çisæ, bay rum.	[external]
†brom'idum,	gr. 5..15	†Sac'chari, rum.	℥ 1..8
†elix'ir,†	℥ 1..2	Vi'ni Gal'lici, brandy.	℥ 1..8
carbo'nas exsic.	gr. 5..15	†mistu'ra,	℥ 1..2
chlor'idum,	℥ ½..[℥ 1]	†Spon'gia us'ta, burnt sponge.	℥ ½..3
common salt.		†Stan'ni pul'vis, tin (and salts).	℥ ½
†cho'las, from oxgall.	gr. 5..15	†bisulphure'tum,	gr. 10..20
†cholef'nas, from oxgall.	gr. 5..15	†chlor'idum,	gr. 1-16.½
†ci'tras,	℥ ½..8	†Staphisa'gris ex. fl.† gtt.1..2 stavesacre.	
†citrotar'tras efferv.†	℥ 1..2	†tinctu'ra,†	gtt. 3..10
†et antimo'nii sul.	gr. ¼..1	Stat'ice, marsh rosemary.	gr. 10..30
†et au'ri chlor.	gr. 1-12.¼	†extrac'tum fl.†	℥ ½..2
hypophos'phis,	gr. 10..30	Stillin'gia, queen's root.	gr. 10..30
hyposul'phis,	gr. 10..60	†extrac'tum æth.† gtt. ½..2	
†iod'idum,	gr. 5..20	†flu'idum,†	gtt. 20..40
†lacto-phosph. syr.†	℥ 1..4	†comp.†	gtt. 30..50
ni'tras,	gr. 10..30	†syru'pus,†	℥ 1..4
cubic nitre.		†compos'itus,†	℥ ½
phos'phas,	℥ 1..8	†tinctu'ra,†	℥ 1
†saliçy'las,	gr. 5..15	†Stillin'gin,†	gr. 2..5
†platino-bichlor.	gr. ⅛..½	Stramo'nii fo'lia, Jamestown weed, thornapple.	gr. 2
sul'phas,	℥ 1..4	extrac'tum,†	gr. ¼..1
Glauber's salts.			
sul'phis†	℥ ½..1		
†glyceri'tum,	℥ 1..3		
†sul'pho-carbo'las,	℥ ½..½		
†sulphovi'nas,	℥ ½..1		
†tar'tras,	℥ 1..8		
et potas'sil,	℥ 1..8		
†valeria'nas,	gr. 1..5		

Reduce these doses to Metric terms by multiplying Grains or Minims by 6½, giving Centigrams; drachms by 4, giving Grams; Ounces by 32, giving Grams.

alcohol'icum, ‡	gr. ¼..1	<b>T.</b>	
flu'idum, ‡	gtt. 4.6	Taba'cum,	gr. 3..[6]
se'men,	gr. 1	<i>tobacco.</i>	
extrac'tum, ‡	gr. ¼..½	tex'trac'tum, ‡	gr. ¼..[½]
flu'idum, ‡	gtt. 2..4	flu'idum, ‡	gtt. 5..[60]
tinctu'ra, ‡	℥ 10..20	o'leum,	gtt. ¼..(1)
Strych'nia,	gr. 1-60..½	vi'num, ‡	℥ 10..30
face'tas,	gr. 1-60..½	Tamarin'dus,	3 ½..2
tar'senis,	gr. 1-60	<i>tamarinda.</i>	
thydrío'das,	gr. 1-60..½	Tanaçe'tum,	3 ½..1
tio'das,	gr. 1-60..½	<i>tansy.</i>	
liq'uor nitra'tis,	℥ 5..10	tex'trac'tum, ‡	3 ½..1
mistu'ra,	3 1	to'leum,	gtt. 2..5
mu'rias,	gr. 1-60..½	Tarax'aci elix'ir,	3 2..6
ni'tras,	gr. 1-60..½	<i>dandelion.</i>	
sul'phas,	gr. 1-60..½	telix'ir comp. ‡	3 2..4
<i>commercial strychnine.</i>		extrac'tum ‡	3 1..3
tinctu'ra comp. gtt.	10..30	flu'idum, ‡	3 1..2
tan'nas,	gr. 1-60..½	compos'itum, ‡	3 1..2
valerian. elix'ir, ‡	3 1	tet sen'næ, ‡	3 1..2
Sty'rax,	gr. 10..20	suc'cus, ‡	3 2..4
<i>storax.</i>		Terebin'thi ol. gtt.	5..3 1
Suc'cini o'leum,	gtt. 5..15	<i>turpentine.</i>	
<i>oil of amber.</i>		Canaden'sis,	gr. 5..10
Sul'phur flos'idum, gr. ½..1		<i>Canada balsam, balsam of fir.</i>	
<i>sulphur.</i>		Tes'ta præpara'ta,	3 ¼..3
præcipita'tum,	3 1..3	<i>prepared oyster shell.</i>	
lo'tum,	3 1..3	†Teu'crium cham.	3 ½
<i>washed sulphur.</i>		<i>germander, English ground pine.</i>	
sublima'tum,	3 1..3	†Thef'na,	gr. 1..(10)
†Sum'bul ex. fl. ‡	3 ½..1	<i>from tea.</i>	
<i>musk root.</i>		†çi'tras,	gr. 1
tresi'na, ‡	gr. 1..2	†lac'tas,	gr. 1
tinctu'ra, ‡	℥ 10..20	†ma'las,	gr. 1
†Svap'nia,	gr. 1	†mu'rias,	gr. 1
<i>from opium.</i>		†Thu'jæ occident. tr.	3 ½..1
†Swiete'nia febrifuga,	3 ½..1	<i>arbor vitæ.</i>	
<i>Indian red-wood tree.</i>		Tig'lii o'leum,	gtt. 1..2
†Sym'phyti ex. fl. ‡	3 1..2	<i>croton oil.</i>	
<i>comfrey.</i>		Thy'mi tex. fl. ‡	3 ½..1
tví'num comp. ‡	3 ½..2	<i>thyme.</i>	
†Symplocar'pi ex. fl. ‡	3 ½..¾	o'leum,	gtt. 1..10
<i>skunk cabbage.</i>		Toluta'num bals.	gr. 10..30
tinctu'ra, ‡	3 1..4	syru'pus, ‡	3 ½
		tinctu'ra, ‡	3 1..2

Reduce these doses to Metric terms by multiplying Grains or Minims by 64, giving Centigrams; drachms by 4, giving Grams; Ounces by 32, giving Grams.

Tormentil'la, <small>common tormentil.</small>	3 ½-1	tinctu'ra, ‡	3 1-4
Toxicoden'dron, <small>poison oak.</small>	gr. 1-3	ammonia'ta, ‡	3 ½-1
†extrac'tum fl. ‡	gtt. 3-30	Vera'tria, <small>alkaloid of cerasilla.</small>	gr. 1-40. ½
†tinctu'ra, ‡	gtt. 3-10	†ape'tas,	gr. 1-40. ½
Tragacan'thæ muçila'go, q. s.		†sul'phas,	gr. 1-40. ½
†Trifol'li prat. ex. fl. ‡	3 ½-1	†tar'tras,	gr. 1-40. ½
<small>red clover.</small>		†Vera'trin ‡	gr. 1-16
†Tril'lium, <small>beth-root.</small>	3 1	<small>Eclectic prep. of veratrum viride.</small>	
†extrac'tum fl. ‡	3 1-2	Vera'trum al'bum, <small>white hellebore.</small>	gr. 1-2
†Tril'lin, ‡	gr. 4-8	†extrac'tum fl. ‡	℥ 2-4
Trios'teum, <small>fever root.</small>	3 1	Vir'ide, <small>American hellebore.</small>	gr. 2-4
†extrac'tum, ‡	gr. 10	†extrac'tum, ‡	gr. ½-¾
†Trit'ici rep. fl. ex.	3 ½-1	flu'idum, ‡	℥ 2-4
<small>dog-grass, couch grass.</small>		tinctu'ra, ‡	gtt. 2-8
†Turpe'thum, <small>turpeth root.</small>	3 ¼-1	†Verbas'ci ex. fl. ‡	3 1-2
†resi'na,	gr. 5-8	<small>mullein.</small>	
†Tussilag'inis ex. fl. ‡	3 1-2	†Verbe'næ hast. ex. fl. ‡	3 ½-1
<small>celt's foot.</small>		<small>vervain.</small>	
†suc'cus,	3 1	†Vibur'ni op. ex. fl. ‡	3 ½-1
		<small>cramp bark, high cranberry.</small>	
		†tinctu'ra comp. gtt.	20-60
		†Prunifo'li ex. fl.	3 1-2
		<small>black haw.</small>	
		†Vibur'nin, ‡	gr. 1-3
		<small>from cramp bark.</small>	
		Vi'num †campa'num,	3 ½-2
		<small>champagne.</small>	
		Gal'lici spir'itus,	3 1-8
		<small>brandy.</small>	
		†Hispan'icūm,	3 ½-1
		<small>claret.</small>	
		Porten'se,	3 1-8
		<small>port wine.</small>	
		Xer'icum,	3 1-8
		<small>cherry wine.</small>	
		Vi'olæ ra'dix,	gr. 8. [60]
		<small>violet root.</small>	
		tsyru'pus, ‡	3 1-2
		†Virid'ia,	gr. 1-40. (1-6)
		<small>alkaloid from veratrum viride.</small>	
		†Vis'cum al'bum,	3 ½-1
		<small>mistletoe.</small>	

## V.

Valeria'na,	3 1-8
extrac'tum, ‡	gr. 10-30
flu'idum, ‡	3 1
oleum,	gtt. 4-7

Reduce these doses to Metric terms by multiplying Grains or Minims by 64, giving Centigrams; drachms by 4, giving Grams; Ounces by 82, giving Grams.

## W.

†Woorá'ra (see Curara).	
†Winte'ra,	3 ½
Winter's bark.	

## X.

†Xan'thium spino'sum,	gr. 10
spiny barbed.	
†extrac'tum, †	gr. 1.5
†flu'idum, †	gtt. 5-10
Xanthorri'za,	9 1.2
yellow root.	
†Xanthorrhoe'æ res.	tr. 3 1.2
grass tree.	
†Xanthox'ylin, †	gr. 2.6
Xanthox'yllum,	gr. 10-30
prickly ash.	
†extrac'tum seth.	gtt. 1.5
†flu'idum,	gtt. 10-30
†Fruct'us ex. fl. †	gtt. 5-10
berries.	
†tinctu'ra,	3 1.4

## Y.

†Yerbae santæ ex. †	gr. 3-12
bear's weed.	
†extrac'tum fl. †	3 ¼-1
†pil'ulæ, †	No. 1.3

## Z.

†Zat'ze,	3 4.6
†Zedoa'ria,	gr. 10-50
andouary.	
Zin'çi açe'tas.	gr. 2.6
zinc (and salts).	
carbo'nas præcip.	gr. 2. (10)
chlor'idum,	gr. 1.2
†cyan'idum,	gr. 1-16. 1-12
†ferrocyan'idum,	gr. 1.4
tiod'idum,	gr. 1.2
†syru'pus, †	gtt. 20-50
flac'tas,	gr. 1.2
ox'idum,	gr. 2.8
flowers of zinc.	
†phos'phas,	gr. 1.3
†phosphora'tum,	gr. 1-66
sul'phas,	gr. 1-[20]
white vitriol.	
†sul'pho-carbo'las,	gr. 1
valeria'nas,	gr. 1.2
†elix'ir, †	3 1.3
Zin'giber,	3 1.1
ginger.	
†elix'ir, †	3 1
extrac'tum fl. †	℥ 10-20
oleoresi'na, †	℥ 1
syru'pus, †	3 1.4
tinctu'ra, †	℥ 5-20
trochis'çi,	No. 1.2

## Preparations.

A'QUÆ.		
(The figures show the amount of drug to the pint.)		
Aç'idi carbol'ici, glyc't.	3 10	
carbon'ici,		
Ammono'niæ,		
Amyg'dalæ ama'ræ, ol.	℥ 8	
bitter almonds.		
Ani'si, ol.	℥ 15	
anise.		
Auran'tii flo'rum,	3 6	
orange flower.		
Cam'phoræ,	3 1	
camphor.		
Chlorin'ii,		
chlorine.		
Çinnamo'mi, ol.	℥ 15	
Creaso'ti,	3 1	

Reduce these doses to Metric terms by multiplying Grains or Minims by 61/2, giving Centigrams; drachms by 4, giving Grams; Ounces by 32, giving Grams.

Destilla'ta,	
Fœnic'ull, ol.	℥ 15
<sup>fennel.</sup>	
†Hedeſ'mæ, ol.	℥ 30
<sup>pennyroyal.</sup>	
Men'thæ piperi'tæ, ol.	℥ 15
<sup>peppermint.</sup>	
Vir'idis, ol.	℥ 15
<sup>spearmint.</sup>	
Ro'sæ,	℥ 6
†Sambu'ci,	
<sup>elder flowers.</sup>	

## CERA'TA.

(The numerator expresses the portion of *drug*, the denominator, of the ex-cipient, in each part of cerate.)

†Calami'næ,	1-5
<sup>Turner's cerate.</sup>	
Çera'tum (simple)	
Canthar'idis,	$\frac{1}{2}$
extrac'ti, (about)	1-5
Çeta'çi,	$\frac{1}{8}$
<sup>spermaceti.</sup>	
†Croto'nis,	$\frac{1}{2}$
<sup>croton oil.</sup>	
Plum'bi subaçeta'tis,	?
<sup>Goulard's.</sup>	
Resi'næ,	$\frac{1}{2}$
<sup>basilicon ointment.</sup>	
compos'itum,	$\frac{1}{3}$
Sabi'næ,	$\frac{1}{4}$
<sup>savine.</sup>	
Sapo'nis,	$\frac{1}{3}$
<sup>soap.</sup>	
Zin'çi carbona'tis,	1-5
<sup>carbonate of zinc.</sup>	

DECOCTA (*afficial*).

(The figures show the amount of drug to one pint of water. The unofficial decoctions are omitted; these are often used as domestic remedies, and

are rarely supplied by the apothecary. They are all made by taking *one ounce* of the drug to each pint of water. The dose of all decoctions is from one to four fluid-ounces three times a day.)

Çetra'riæ,	℥ $\frac{1}{2}$
<sup>Iceland moss.</sup>	
Chimaph'ilæ,	℥ 1
<sup>pipisawwa.</sup>	
Çincho'næ fla'væ,	℥ 1
<sup>yellow cinchona.</sup>	
ru'bræ,	℥ 1
<sup>red cinchona.</sup>	
Cor'nûs Flor'idæ,	℥ 1
<sup>dogwood.</sup>	
Dulcama'æ,	℥ 1
<sup>bittersweet.</sup>	
Hæmatox'ylî,	℥ 1
<sup>logwood.</sup>	
Hor'del,	℥ 2
<sup>barley.</sup>	
Quer'cûs al'bæ,	℥ 1
<sup>white oak.</sup>	
Sarsaparil'æ comp.	℥ 1 $\frac{1}{2}$
Sen'egæ,	℥ 1
<sup>senega snake root.</sup>	
U'væ ur'si,	℥ 1
<sup>bear berries.</sup>	

## ELIX'IRES.

(These are a pleasant mode for the administration of remedies. The dose is from one to two fluid-drachms three or four times daily.)

†Aç'idi salicy'liçi,†
†et fer'ri,†
†Ammono'li brom'idi,†
†et mor'phiæ,†
†et potas'sii brom'idi,†
†et quin'ia,†
†et strych'niæ,†
†et valeriana'tis,†

**Reduce these doses to Metric terms by multiplying Grains or Minims by 6 $\frac{1}{2}$ , giving Centigrams; drachms by 4, giving Grams; Ounces by 32, giving Grams.**

†Beberl'næ et fer'ri,†	†Gentia'næ,†
*Bismu'thi,†	†et fer'ri chlor'idi,†
†et strych'nizæ,†	†fer'ri pyrophospha'tis,†
†Bu'chu,†	†Glycyrrhi'zæ aromati'cæ,†
†compos'itæ,†	†Grinde'liæ aromati'cæ,†
†et parel'ræ,†	†Guara'næ,†
†et u'væ ur'si,†	†Helo'nias,†
†Cal'cii brom'idi,†	†compos'itæ,†
†Calisa'yæ,†	†Hu'muli,†
†bismu'thi et pepsi'næ,†	†Jaboran'di,†
†bismu'thi et strych.†	†Lith'iæ citra'tis,†
†et pep'sinæ,†	†benzoa'tis,†
†et strych'nizæ,†	†Lupuli'næ,†
†fer'ri et bismu'thi,†	†Mati'co,†
†phosph. et pepsi'næ,†	†compos'itæ,†
†protox'idi,†	†Mor'phiæ valeriana'tis,†
†pyrophospha'tis,†	†compos'itæ,†
†Caffei'næ citra'tis,†	†Pancreati'næ,†
†Cathar'ticæ compos'itæ,†	†Pepsi'næ,†
†Chlora'lis hydra'tis,†	†et bismu'thi,†
†Çimiçif'ugæ,†	†et nu'cis vom'icæ,†
†compos'itæ,†	†et pancreati'næ,†
†Coryd'alis compos'itæ,†	†et bismu'thi,†
†Fer'ri brom'idi,†	†et pte'leæ,†
†bismu'thi et strych.†	†et quin'izæ,†
†citra'tis et arsen'ci,†	†et strych'nizæ,†
†et pepsi'næ,†	†et fer'ri,†
†et strych'nizæ,†	†Phospha'tium comp.†
†et pru'ni Virginia'næ,	†Phos'phorus,†
†phospha'tis,†	†Podophyl'li compos'itæ †
†quin'izæ et strych'nizæ,†	†Potas'sii brom'idi,
†protox'idi,†	†Pru'ni Virginia'næ,†
†cincho. et cal'cii iod.†	†Quin'izæ,†
†do. cum arsen'ico,†	†bismu'thi et strych'nizæ,†
†et potas'sii iod'idi,†	†brom'idi,†
†pyrophospha'tis,†	†et arsen'ici,†
†et strych'nizæ,†	†fer'ri et strych'nizæ,†
†quin'izæ et arsen'ici,†	†valeriana'tis,†
†et strych'nizæ,†	†Rhe'i et calum'bæ,†

Reduce these doses to Metric terms by multiplying Grains or Minims by 64, giving Centigrams; drachms by 4, giving Grams; Ounces by 32, giving Grams.



†*tet magne'siæ*, †  
 †*Ru'bræ* (simple red), †  
 †*So'dii brom'idi*, †  
 †*Stillin'giæ*, †  
 †*compos'itæ*, †  
 †*Strych'niæ valeriana'tis*, †  
 †*Tarax'açi*, †  
 †*compos'itæ*, †  
 †*Valeria'næ*, †  
 †*Zin'çi valeriana'tis*, †

## EMPLAS'TRA.

(The numerator expresses the portion of *drug*, the denominator of *excipient*, in each part of plaster).

†*Aç'idi carbol'ici*,  $\frac{1}{3}$   
*Aconi'ti*, 1  
     *aconite.*  
*Ammoni'açi*, *all*  
     *ammoniac.*  
     *cum hydrar'g, A. 12; H. ¼*  
     *ammoniac with mercury.*  
*Antimo'nii*,  $\frac{1}{2}$   
     *antimonial.*  
*Ar'niçæ*,  $\frac{1}{2}$   
*Aassæt'idæ*, (about)  $\frac{1}{2}$   
*Belladon'næ*, 1  
     †*compos'itum*,  $\frac{1}{6}$   
     *belladonna and conium.*  
 †*Calefa'ciens*,  
     *warming plaster.*  
 †*Cap'siçi compos'itum*,  
     *strengthening.*  
 †*Çe'ræ*,  
     *wax plaster.*  
 †*Çicu'tæ*,  
     *hemlock plaster.*  
     †*cum gummifresi'nis*,  
     *plaster of gum resins.*  
 †*Cumi'ni*,  
     *cumin plaster.*  
*Fer'ri*, 1-10  
     †*tox'idi rub'ri*,  
*Gal'bani compos'itum*, 1-5

†*Gummo'sum*,  
     *gum diachylon.*  
*Hydrar'gyri*,  $\frac{1}{3}$   
     †*compos'itum*,  
 †*Lyt'tæ* (about)  $\frac{1}{2}$   
     *blistering plaster.*  
     †*compos'itum*,  
     *strong blistering plaster.*  
 †*Myri'çæ*,  $\frac{1}{2}$   
     *green salve.*  
 †*Norimbergen'se*,  
     *Nuremberg plaster.*  
*O'pii*, 1-5  
*Pi'çis Burgun'diçæ*, 12  
     †*compos'itum*,  
     *Canaden'sis*, 12  
     *cum canthar'ide*, 1-12  
*Plum'bi*, (about)  $\frac{1}{2}$   
     *litharge plaster.*  
     †*tox'idum rub.*  
     *red oxide of lead.*  
*Resi'næ*,  $\frac{1}{2}$   
     *adhesive.*  
     †*compos'itum*,  
     *strengthening adhesive.*  
*Sapo'nis*, 1-9  
     *soap plaster.*  
 †*Thu'ris*,  
     *frankincense plaster.*

INFU'SA (*officinal*).

(The figures denote the amount of drug to a pint of water. The unofficial are all made with 1 ounce of the drug to one pint of water. The dose of all infusions is from 1 to 2 fluid-ounces three times a day.)

*Angustu'ræ*,  $\frac{3}{4}$   
*Anthem'idis*,  $\frac{3}{4}$   
     *chamomile.*  
*Bu'chu*,  $\frac{3}{4}$   
*Calum'bæ*,  $\frac{3}{4}$   
*Cap'siçi*,  $\frac{3}{4}$   
     *red pepper.*

Reduce these doses to Metric terms by multiplying Grains or Minims by  $\frac{1}{6}$ , giving Centigrams; drachma by 4, giving Grams; Ounces by 32, giving Grams.

## W.

†Woorá'ra (see Curara),  
 †Winte'ra, 3 ½  
 Winter's bark.

## X.

†Xan'thium spino'sum, gr. 10  
 spiny burreed.  
 †extrac'tum, † gr. 1.5  
 †flu'idum, † gtt. 5.10  
 Xanthorri'za, 3 1.2  
 yellow root.  
 †Xanthorrhœæ res. tr. 3 1.2  
 grass tree.  
 †Xanthox'ylin, † gr. 2.6  
 Xanthox'yllum, gr. 10.30  
 prickly ash.  
 †extrac'tum æth. gtt. 1.5  
 †flu'idum, gtt. 10.30  
 †Fruc'tus ex. fl. † gtt. 5.10  
 berries.  
 †tinctu'ra, 3 1.4

## Y.

†Yerbæ santæ ex. † gr. 3.12  
 bear's weed.  
 †extrac'tum fl. † 3 ¼.1  
 †pil'ulæ, † No. 1.3

## Z.

†Zat'ze, 3 4.6  
 †Zedoa'ria, gr. 10.30  
 sedary.  
 Zin'çi açe'tas, gr. 2.6  
 zinc (and salts).  
 carbo'nas præcip. gr. 2. (10)  
 chlor'idum, gr. 1.2  
 †cyan'idum, gr. 1-16.1-12  
 †ferrocyan'idum, gr. 1.4  
 iod'idum, gr. 1.2  
 †syru'pus, † gtt. 20.50  
 †lac'tas, gr. 1.2  
 ox'idum, gr. 2.8  
 flowers of zinc.  
 †phos'phas, gr. 1.3  
 †phosphora'tum, gr. 1-66  
 sul'phas, gr. 1. [20]  
 white vitriol.  
 †sul'pho-carbo'las, gr. 1  
 valeria'nas, gr. 1.2  
 telix'ir, † 3 1.3  
 Zin'giber, 3 ½.1  
 ginger.  
 †elix'ir, † 3 1  
 extrac'tum fl. † ℥ 10.20  
 oleoresi'na, † ℥ 1  
 syru'pus, † 3 1.4  
 tinctu'ra, † ℥ 5.20  
 trochis'çi, No. 1.2

## Preparations.

A'QUÆ.  
 (The figures show the amount of drug to the pint.)  
 Aç'idi carbol'ici, glyc't. 3 10  
 carbon'ici,  
 Ammo'niæ,  
 Amyg'dalæ ama'ræ, ol. ℥ 8  
 bitter almonds.  
 Ani'si, ol. ℥ 15  
 anise.  
 Auran'tii flo'rum, 3 6  
 orange flower.  
 Cam'phoræ, 3 1  
 camphor.  
 Chlorin'ii, chlorine.  
 Cinnamo'mi, ol. ℥ 15  
 Creaso'ti,

Reduce these doses to Metric terms by multi-  
 Grains or Minims by 6¼, giving Centigrams; dra-  
 4, giving Grams; Ounces by 32, giving Grams.

**Ammo'nii aceta'tis,**  
spirit of Mindererus.

†**Arsenia'tis,** 1  
Biette's arsenical solution.

†tartariza'ti, 2½

**Arsen'ici chlor'idi,**  
et hydrarg. iod'idi, 88 4½

†**Atro'piæ sulph.** 4

**Ba'rii chlor'idi,** 160

†**Bismu'thi et Am. cit.**

**Cal'cii chlor'idi,**

**Cal'cis,**  
lime water.

†compos'itus,

†sulphure'ti,

†**Cu'pri ammon. (about)** 4

†sulpha'tis comp. 45

**Fer'ri chlor'idi,**

çitra'tis,

nitra'tis,

subsulpha'tis,  
Monsel's solution.

tersulpha'tis,

**Guttaper'chæ,**

**Hydrar'gyri nitra'tis,**

**Iodin'li compos'itus,**

**Magne'sii çitra'tis,**

**Mor'phiæ sulpha'tis,**

**Plum'bi subaceta'tis,**  
Goulard's extract.

subaceta'tis dilu'tus,  
Goulard's lotion.

**Potas'sæ,**

**Potas'sii arseni'tis,** 4  
Fowler's solution.

çitra'tis,

neutral mixture.

permangana'tis, 4

**So'dæ,**

chlorina'tæ,

**So'dii arsenia'tis,** 4

**Zin'çi chlor'idi,**

†sulpha'tis cum camphorâ

## LOTION-ES.

†**Alkali'na,**  
carbonate of soda.

†**Æth'eris compos'ita,**  
ether, ammonii acet. alcohol.

†**Ammo'nii muria'tis,**

†**Bora'cis,**

†cum mor'phia,

†**Cu'pri sulpha'tis camph.**  
Bates' "red wash."

†**Glyçeri'næ,**

†**Hydrar'gyri fla'va,**  
yellow wash.

†ni'gra,

black wash.

†ru'bra,

red wash.

†**Hydras'tis compos'itæ,**  
golden seal compound.

†et aconi'ti,

†**Juglan'dis,**  
walnut.

†**Lobe'liæ compos'ita,**

†**Myr'r hæ compos'ita,**  
myrrh, acetate lead and zinc.

†**Potas'sii sulphure'ti,**  
Barlow's lotion.

†**Refrig'eran's,**  
salt, vinegar, alcohol.

†**Sas'safras,**

†**So'dii compos'ita,**  
salt, sulph. zinc and iron.

†**Zin'çi compos'ita,**  
alum and sulphate zinc.

## PIL'ULÆ.

Figures in ( ) show size of pill in *grains*, or the amount of *drug* in *each*; out of parenthesis, number of pills at a dose; when following a drug, in list of ingredients, the amount in *grains* in *each pill*. All are manufac-

*Reduce these doses to Metric terms by multiplying Grains or Minims by 6½, giving Centigrams; drachms by 4, giving Grams; Ounces by 32, giving Grams.*

tured in sugar-coated form by Parke, Davis & Co.		†Ape'rient (3)	1..2
		ex. nuc. vom. 1-3, ex. hyoscy. 1-2, ex. colocy. comp. 2.	
†Aconi'tiæ, (1-60)	1..2	†Ape'rient (3½)	1..2
†Aconi'ti ext. (¼, ⅓, 1)		rhei 1 1-4, aloes 1 1-4, ipecac 5-12, nuc. vom. 1-2.	
†compos'itæ,	1	†mild (3)	1..2
stramonium, valerian. quiniæ.		ex. colocy. comp. 1-2, rhei 2, ol. cari, ex. hyoscyami 5-6.	
Al'oës (4)	1..3	†Argen'ti iod'idi (¼)	1..2
†compos'itæ,	2..4	†nitra'tis (¼)	1..2
eupator., podophyl., panax.		†Arsenio'si aç'idi, (1-12),	
et assafœt'idæ (4)	2..5	1-20, 1-32, 1-50, 1-60).	
†et fer'ri (3)	1..3	Assafœt'idæ (4)	1..3
ferri sulph. 1, conf. ex. 1-2, zin- giberis 1-3.		†compos'itæ (2½)	1..2
et mas'tiches (3)	1..2	opii, assafœt., am. carb. aa 4-5.	
et myr'rhæ (4)	3..6	†et fer'ri (3)	2..5
†et nu'cis vom'icæ (2)	1..2	†et rhe'i (3)	2..4
aloes 1 1-2, nuc vom. ex. 1-2.		†Atro'piæ (1-60)	1..2
†Aliterati'va (1¼)	1..2	†Bapti'siæ comp.	1
blue pill 1, opium 1-5, ipecac 1-8.		ex. leptand., podophyllin, sanguinarina, ex. baptisizæ.	
†Ammo'nii brom'idi (1)	1..5	†Ballou's (3)	1..3
†picra'tis (⅓, ¼, ⅓, 1).		ex. colocy. comp. 1, calomel 1, ex. jalapæ 1, ipecac 1-8.	
†valeriana'tis (1)	1..2	†Belladon'næ (¼, ⅓, 1),	
†An'deison's Scots' (2)	2..5	Bismu'thi et igna'tiæ (4¼) 1..2	
aloes, colocynth, gamboge, soap, ol. anis.		bism. subnit. 4, ex. ignatim 1-4.	
†Anthem'idis ex. (2)	1..2	†et nu'cis vom'icæ (5½) 1..2	
†Antibil'ious (2¼)	2..3	bism. subnit. 5, ex. nuc vom. 1-2.	
ex. colocyn. comp. 2 1-2, podophyl. 1-4.		†subcarbona'tis (3)	2..5
†Antichill (4)	1..2	†subnitra'tis (2, 3)	1..5
chloïdine 1, arsen. acid 1-20, ferri ferrocyân. 2, ol. piperis 1.		†Caffel'næ citra'tis (1)	1
†Anticonstipation (1)	1..2	†Calisa'yæ alkaloid (2)	1..3
podophyl. 1-10, ex. nuc. vom. 1-4, ex. bell. 1-10, ex. hyoscy. 1-4, caps. 1-4.		sulph quiniæ, quindisæ, cinchonæ, cinchonidisæ, aa. gr. 1-2.	
†Antiepileptic (3)	1..2	†Calomela'tis (½, 1, 2, 3, 5) 1..3	
ferri hydrocyan. 1-2, zinci valerian. 1-2, quiniæ valer. 1, ex. valerianæ 1.		†et o'pii (3)	1
†Antimalarial (2)	1..2	calomel 1, opii 1.	
quiniæ sulph. 1, gelsemin 1 4, ferri sulph. 1-4, podophyl. 1-5, arsen. acid 1-60, oleores. piperis 1-16.		†et colocyn. c. ex. (8½) 1..3	
†Anthelmin'tic (2)	1..2	calomel 1, ex. c. comp. 2 1-2.	
calomel 1, antonine 1.		†et rhe'i (1¼)	1..3
Antimo'nii comp. (3)	1..3	†Campho're compos'ita	1
†et potas'sii tart. (¼, ⅓, 1-6)		camphor, opium, kino, capalcum.	
†Apoç'yni (2)	1	†et hyoscy'ami (2)	1
		†et o'pii (3)	1
		camph. 2, opii 1.	

•Reduce these doses to Metric terms by multiplying  
Grains or Minims by 6¼, giving Centigrams; drachms by  
4, giving Grams; Ounces by 32, giving Grams.

†et o'pli et aq'idi tan'niçi (3¼) 1.2 camph. 1, opil 1-4, tannin 2.	†blue (3) 1.3 coloc. comp. 2 1-2, blue pill 1-2.
†monobroma'tis (3) 1	†blue and ipecac (4 1-6) 1.3 coloc. comp. 2, blue pill 2, ipe- cac 1-6.
†Can'nabis Ind. ex. (¼, ½, 1) 1	†hyoscy'ami (3) 1.3
†Cap'siçi (1) 1	†ipecacuan'hæ (3) 1.3
†extrac'ti (½) 1	†podophyl'in (3) 1.3
Cathar'ticæ comp. (3) 2.4	†Coni'i ex. (¼, ½, 1).
†modified (3½) 1.3	†ipecacuan'hæ (1) 1.2
ex. coloc. comp., gamboge 1-6, ex. jalapæ 3-4, rhei 1-2, calomel 3-4, singiber 1-4.	†Cook's Pill (3) 2.4 aloes 1, soap 1-2, rhei 1, calo- mel 1-2.
†improved (3) 2.3	Copai'bæ (3) 2.6
ex coloc. comp., leptandrin, ex. jalapæ, ex. hyoscyami, podophylli, ol. menth. pip.	†Copai'bæ comp. (3) 3.4 pil copai'bæ 1 1-2, citrate iron, gualac 3-8, ol. resin, cu- bebs 5-8.
†vegetable, 1.3	†ex. cube'bæ (3) 2.4 pil copai'bæ 2, ol. resin, cu- bebs 1.
ex. coloc. comp. 1-3, aloes 1 1-4, podophyllin 1-4, car- damomi 1-3, resinæ scam. 1-3, saponis 1-3.	†cube'bæ et cit. fer'ri (3) 2.4
†Caulophyl'in (½) 1.2	†Cor'nin (2) 1.2
†Chapman's dinner (3) 1.2	†Cor'nûs Flor'idæ ex. (2) 1.2
aloes 1, rhei 1, mastiches 1.	†Cube'bæ ex. (2) 1.2
†Chimaph'ilæ ex. (3) 1.2	†et alu'minis (3) 1.4
†Chinol'diæ (1) 2.4	†et krame'riæ et fer'ri (3) 1.4 ex. cubebs 1 1-2, ex. rhatany 1-2, iron sulph. 1.
†Chinol'diæ comp. (3½) 1.2	†Cypripe'dii ex. (2) 1.2
chinoidine 2, sulph. ferri 1, piperin 1-2.	†Digita'lin (1-60) 1.2
†Chol'agogue (3) 1.3	†Digita'lis ex. (½) 1.2
podophyllin 1-4, aloes 1, ex. henbane 1-2, rhei 1, cap- sici 1-4.	†Dinner Pill (Lady Web- ster's) (3) 1.2 aloes, mastiches, ipecac, rose leaves.
†Cimicifugæ comp. 1	†Diuret'ic (3) 1.2 soap 1 1-2, sod. carb. 1 1-2, oil juniper one drop.
ex. cimicifug., scutellarina, valer. quiniæ.	†Dupuytren (3¼) 1 gualaci 3, corroa. sublimate 1-10, opil 1-3.
†Cimicifugin (1) 1.2	†Dys'entery Pill (2½) 1.2 blue pill 1, ipecac 1, gelsemin 1-6.
†Cincho-Quinine (1, 2, 3) 1.6	†Dyspep'sia (2) 1.2 ex. ignatiæ mar., ex. rhei, ex. cinchozæ flav., capsici.
†Cincho'niæ sulph. (1½, 3) 1.2	†Elate riil (½) 1.2
†Cinchonid'iæ sulph. (1, 2, 3) 1.2	
†Coch læ (3) 1.2	
ex. coloc. comp., gamboge, aloes, scammony, sulph. potass.	
†Codei'æ (1-16) 1.2	
†Col'chiçi ex. (½) 1.3	
†Colocyn'thidis comp. ex. (3) 2.4	

\* Reduce these doses to Metric terms by multiplying Grains or Minims by 6¼, giving Centigrams; drachma by 4, giving Grams; Ounces by 32, giving Grams.

†Emmenagogue (3½) 1..3	†redac'ti (1, 2) 1..3
sulph. ferri ex. 1 1-2, aloes 1-2, gum turpentine 1 1-2.	†et strych'nise (2) 1..2
†improved (4¼) 1..3	strychnise 1-60, ferri redact. 2.
ergotine 1, ex. hellebori nig. 1, aloes 1, ferri sulph. 1, ol. sabinæ 1-2.	†sulpha'tis exsic. (2, 4) 1..3
†Eucalyp'ti ex. (2) 1..3	†valeriana'tis (1) 1..2
†ecompos'itæ (2) 1..3	Galbani comp. (3½) 1..3
ex. eucalyp'ti 1, sanguinarin 1-3, ex. apocyni 1-2.	galbani 1 1-2, myrrhæ 1 1-2, assafoet. 1-2.
†Eupur'purin comp., 1	†Gambo'gisæ comp. (3) 2..5
zanthoxylin, strychnia.	gamboge, zingiberis, aloes, saponis.
†Fel'lis bov'ni (3) 1..3	†Gelse'min (¼, ½) 1..2
orgall 2, zingiberis 1.	†Gentia'næ comp. (3) 2..4
†ecompos'itæ (2½) 1..3	ex. gentianæ 2-3, rhei 1 1-3, aloes 2-3, ol. cari 1-5.
orgall, aloes, ex. stramonii, hydrastin.	†extrac'tum (2) 2..5
†et peps'i'næ (4½) 1..2	†Gera'nin (1) 1..3
orgall, aloes, pepain, ex. nucis vom., ferri sulph.	†Gonorrhœ'a (3) 1..3
†Female, amenorrhœ'a (4) 1..2	cubebæ 1 1-4, ferri sulph. 1-4, copaibæ 1-4, Venice tur- pentine 1-4.
sulph., aloes.	†Helleb'ori ex. (1) 1..2
†leucorrhœ'a (3) 1..3	†Hepat'icæ (3½) 1..3
hamamelin 2, hydrastin 1-2, senecion 1-2.	blue pill 2, ex. coloc. co. 2-3, ex. hyoscyami 2-3.
†Fer'ri et al'oë's (3) 1..3	†Hel'onin (¼) 1..2
aloes 2, ferri sulph. 1.	†Hooper's (female) (2¼) 1..3
†itra'tis (2) 1..5	aloes, myrrhæ, sulph. ferri, sapon., ex. clmicif., canel- læ, zingiberis.
†et quinqu' (1. 2) 1..5	Hydrarg'ryri (3) 1..4
†et strych'nise (2) 1..3	†chlor'idi cor. (1-30, 1-20, 1-16, 1-12, ¼.)
strychnise cit. 1-50, ferri cit. 2.	†iod'idi ru'bri (½, 1-16) 1..2
ecompos'itæ (3) 2..6	†vir'idis (¼, ½) 1..2
myrrhæ, sodii carb., ferri sulph.	†et o'pii (1½) 1..2
†carbona'tis (3) 1..4	bg. iodidi 1, opii 2-3.
Vallet's pillæ.	†Hydras'tin (1) 1..2
†et mangane'sii (3) 1..4	†alkaloid (1) 1..3
†ferrocyan'idi (3) 1..2	†Hyoscy'ami ex. (¼, ½, 1.)
†hydrocyan'idi (½) 1..2	ecompos'itæ 1
iod'idi (1) 1..2	ex. valerian, aconiti, quinaïæ.
†lacta'tis (1) 1..6	†Iгна'tiæ amar. ex. (¼, ½, 1.)
†phospha'tis (2) 1..4	†Iodin'ii (½) 1..2
†protiod'idi et quinqu. (2) 1	†Iodoform' (1) 1..2
†pyrophospha'tis (1) 1..6	†et fer'ri (2) 1..2
†quas'siæ et nu'cis vom. (3) 1..2	von by hydrogen 1, iodoform 1.
ferri redact. 1 1-2, ex. quassie 1, saponis 1-2, ext. unciæ vom. 1-4.	

Reduce these doses to Metric terms by multiplying Grains or Minims by 6¼, giving Centigrams; drachms by 4, giving Grams; Ounces by 32, giving Grams.

†Ipecacuan'hæ ex. ( $\frac{1}{4}$ )	1.4	†Pepsi'næ et bism. ( $2\frac{1}{2}$ )	1.2
†et scil'læ (3)	1.4	pepsin 1 1-2, bismuth subcarb	
†et o'pii (1)	1.4	3-4, lactic acid 1-4.	
opii 1-4, ipecac 1-4, sulph.		†et fer'ri iod'idi (3)	1.2
potass. 1-2.		pepsin 1 1-2, iodide iron 3-4,	
†I'risin ( $\frac{1}{4}$ , 1)		iron by hydrogen 1 1-2.	
†compos'itæ ( $\frac{1}{8}$ )	1..3	†et fer'ri redac'ti ( $2\frac{1}{4}$ )	1.2
irisin 1-4, podophyllin 1-10,		pepsin 1 1-2, iron by hydro-	
sulph. strychniæ 1-40.		gen 3-4.	
†Jala'pæ comp. ( $3\frac{1}{4}$ )	1..3	†Phos'phori (1-50, 1-100)	
jalapæ 3-4, saponis 3-4, rhel		†compos'itæ ( $\frac{1}{4}$ )	1..2
3-4, pli. calomel comp.		phosph. 1-100, ex. nuc. vom. 1-4.	
1 1-8, oil cast one drop.		†er'ri et quin. ( $2\frac{1}{4}$ )	1
†extrac'tum (1)	1..3	phosph. 1-100 carb. ferri, 1,	
†Jal'apin (1)	1..2	quinia, 1.	
†Kermes' mineral ( $\frac{1}{4}$ )	1..3	†do et nucis vom. ( $3\frac{1}{4}$ )	1
Krame'riæ ex. (2)	1..3	phos. 1-100, ext. nuc. vom. 1,	
Lactu'cæ ex. (2)	1..3	carb. ferri, 1, quinia sulph. 1.	
†Leonu'ri compos'itæ,	1	†nucis vom'icæ et fer'ri, 1..2	
ex. leon.. ex. aletris, ex. lep-		phosphori 1-100, ex. nuc. vom.	
tand., ex. cimicifugin.		1-4, phosphate iron 1-2.	
†Leptan'drin ( $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{1}{2}$ , 1)		†zin'ci et strych'niæ (1) 1..2	
†compos'itæ ( $1\frac{1}{2}$ )	1..2	phosphori 1-70, valer. zinci 3-4,	
leptandrin 1, irisin 1-4,		strych. 1-30.	
podophyllin 1-8.		†Phytolac'cæ comp.	1
†Lupuli'næ (3)	2..4	ex. phytolac., ex. stillingia,	
†Magne'siæ (2)	2..5	ex. stramonii.	
†et rhe'i (2)	2..4	†Phytolac'cin ( $\frac{1}{8}$ )	1..2
†Mor'phæ aceta'tis ( $\frac{1}{8}$ )	1..3	†Podophyl'li ex. (1)	1..2
†sulph. ( $\frac{1}{4}$ , 1-6, $\frac{1}{8}$ , 1-16, 1-32)		†Podophyl'lin (1, $\frac{1}{2}$ , $\frac{1}{4}$ , $\frac{1}{8}$ ).	
†compos'itæ ( $\frac{1}{8}$ )	1	†et blue ( $2\frac{1}{4}$ )	2..4
sulph. morph. 1-4, calomel 1-4,		podophyllin 1-4, blue pill 2.	
tart. potass. et ant. 1-4.		†comp. ( $\frac{1}{8}$ )	1..2
†valeriana'tis ( $\frac{1}{8}$ )	1..2	podophyllin 1-2, ex. hyocy-	
†Neuralgic (Gross') ( $2\frac{1}{2}$ )	1..2	ami 1-8, ex. nucis vom. 1-16.	
sulph. quinia 2, ex. aconiti		†comp. (eclec'tic) ( $\frac{1}{8}$ )	1..2
1-2, sulph. morph. 1-20,		podophyllin 1-8, leptandrin	
strych. 1-30, arsen. acidi 1-20.		1-16, juglandin 1-16, mac-	
(without morphia) ( $2\frac{1}{4}$ )	1..2	rotin 1-32, ol. capici 1-32.	
idiopath'ic ( $3\frac{1}{4}$ ).	1	†Pop'py ex. (2)	1..2
ex. hyocyami 2-3, ex. conii		†Potas'sii brom'idi (1, 5)	1..6
2-3, ex. ignatiæ 1-2, ex.		†iod'idi (2, 5)	1..3
aconiti 1-3, ex. cannabæ		†permangana'tis ( $\frac{1}{8}$ )	1..2
ind. 1-4, ex. stramonii 1-5,		†tartra'tis et fer'ri (2)	1..5
ex. belladon. 1-6.		†Ptelin compos.	1
Nu'cis vom'icæ ex. ( $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{1}{2}$ )		cimicifugin, berberina chlor.,	
O'pii (1, $1\frac{1}{2}$ )		ptelin, ex. aletris, ex. nuc.	
†et plum'bi acet. (2)	1	vom.	
opii 1, aet. lead 1.		†Quas'siæ ex. (1)	1..5
		Qui'niæ sulph. ( $\frac{1}{4}$ , $\frac{1}{8}$ , 1, 2, 3)	

*Reduce these doses to Metric terms by multiplying Grains or Minims by 64, giving Centigrams; drachma by 4, giving Grams; Ounces by 32, giving Grams.*

†comp. (2)	1.2	†Strych'nise sulph. (1-16, 1-80, 1-32, 1-48, 1-60)	
sulph. quinae 1, iron by hy- drogen 1, arsenious acid 1-32.		†compos'itæ,	1
†et al'oës (1)	1.4	strych. 1-100, phosph. 1-100, ex. cannabis ind. 1-16, carb. ferri 1, ginseng 1.	
†et blue pill (3¼)	1.2	†Tarax'aci ex. (8)	1.5
sulph. quinae 1, blue pill 2, ol. res. piperis, 1-4.		†compos'itæ,	1.2
†et ex. belladon'næ (1½)	1.2	sanguinariae, podophyllin, ol. menth. vir., ex. taraxaci.	
quinae sulph. 1, ex. belladom. 1-2.		†Tan'nici ac'idi (1)	1.10
†et fer'ri (2)	1.5	aloes 2, podophyllin 1-4, blue pill 1.	
quinae 1, ferri redact. 1.		†Tonic hæmætic (2½)	1.2
†et fer'ri et strychn'ise (3) 1.3		sulph. quinae, ipecac, iron by hydrogen, sulph. strychn., arsenious acid.	
sulph. quinae 1, carb. ferri 3, sulph. strychn. 1-60.		†Tril'tin (½)	1.3
†et fer'ri carb. (2)	1.3	†Triplex (3)	2.4
†valeriana'tis (¾)	1.2	†U'væ ur'si ex. (2)	1.2
†et fer'ri (2)	1.2	†Valeria'næ ex. (2)	1.3
Rhe'i (3)	1.5	†compos'itæ,	1
rhei 2 1-4, saponis 3-4.		ex. scutellarise, ex. antho- mis, ex. eupatorii, quinae sulph., capsici.	
comp. (3½)	2.4	†Vera'tris (1-12, 1-32, 1-60)	
rhei 1, aloes 1 1-2, myrrhæ 1, ol. menth. pip.		†Vera'tri vir. ex. (¼, ½)	1.2
†et blue (3¼)	2.5	†Vibur'ni compos'itæ,	1.3
blue pill 1 3-4, rhei 1, sodii carb. 1-2.		ex. viburni, ex. caulophylli, ex. aletris, ex. mitchellise.	
†et fer'ri (3)	1.3	†Zin'çi valeriana'tis (1)	1.3
†extrac'tum (1)	2.10		
†Rheumatic (3)	1.3		
ex. coloc. comp. 1 1-2, ex. hy- oscyami 1-3, ex. colch. acet. 1, calomel 1-3.			
†Saliçyl'ici ac'idi (1)	1		
†Santoni'ni (¼, 1)	1.3		
†Sanguina'ris ex. (3)	1.3		
†Sanguina'rin (½, 1)			
†Sabi'næ ex. (1)	1.2		
†Sapo'nis compos'itæ,	3		
ol. juniper, ol. sassafras, ol. menth. vir.			
et o'pii (3)	2.3		
†Sarsaparil'is ex. (3)	1.4		
Scil'la comp. (3)	1.3		
scillae 3-8, saponis 1 1-8, am- moniac 3-4, singiberis 3-4.			
†So'dii bicarbona'tis (4)	1.4		
†Stillin'gin (1)	1.4		
†Stramo'ni ex. (¼, ½, 1)			

## SUPPOSITORIA.

(The figures express the amount of drug, *in grains*, in each suppository.)

Ac'idi carbol'ici,	1
tan'nici,	5 or † 2
A'loës,	5
Assafœt'idæ (about)	3
†Atro'piæ,	1-60
Beladon'næ,	¾, † ¼
†Hydrar'gyri,	5
†Hyoscyam. et o'pii, H <sub>2</sub> ; O 1	
Mor'phiae,	½, † ¼, † ⅛

Reduce these doses to Metric terms by multiplying Grains or Minims by 6¼, giving Centigrams; drachms by 4, giving Grams; Ounces by 32, giving Grams.



O'pil,	1: $\frac{1}{2}$ ; †2	Aç'idi tan'niçi,	gr. 1
†et belladon.	O. 1; B. $\frac{1}{4}$ .. $\frac{1}{2}$	†cit'riçi,	gr. 6
†et açid' tan'niçi,	O. 1; T. 2	†salıçyl'ıci,	gr. 1
Plum'bi,	3	†tarta'riçi,	gr. 6
et o'pil,	P. 3; O. $\frac{1}{2}$	†Althæ'sæ,	
†do.	O. 1; P. 5;	†Alum'inis et ki'no,	
†Potas'sii chlora'tis comp.		†Ammo'nii (about)	gr. $\frac{1}{2}$
chlo. pot. 15; aluminis, 5.		†Bismu'thi,	gr. 2
†iod'idi compos'ita,		†et car'bo lig'ni,	
pot. iod. 8; ex. conil, 3.		†Cap'siçi,	gr. 1
†Zin'çi sulpha'tis comp.		†et lobe'liæ, C. gr. 1; ol. L.	
zinc. sulph., 3; aluminis, 10.			℥ 1-10

## PULVE'RES.

(Figures show the doses in grains.)

Al'oës et canel'læ,	10..20	†Car'bo lig'ni,	
†Amyg'dalæ comp.	℥. s.	†Caryophyl'li,	
†Antimonia'lis,	3..8	†Cat'echu,	gr. 1
Aromat'icus,	10..30	†Cinnamo'mi,	
†Cat'echu comp.	15..30	†Cory'zæ,	
†Cre'tæ aromat.	30..60	Cretæ,	gr. 4
†cum o'pio,	10..20	†Croto'nis ol.	℥ $\frac{1}{2}$
Effervesce'n'tes,		Cube'bæ oleores.	℥ $\frac{1}{2}$
soda powders.		†Dioscore'æ ex.	gr. 2
aperien'tes,		†Emeti'næ,	2-5
Sedlitz powders.		Fer'ri redac'ti,	gr. 1
Ipecacuan'hæ comp.	5..10	†subcarbona'tis,	gr. 5
Dover's powder.		†Gaultheri'æ,	
Jala'pæ comp.	30..60	Glyc'cyrr'hizæ †compos'iti,	
†O'pil comp.	5..10	ammoni chlor. gr. 3-4, morphinæ	
†Rhe'i comp.	30..60	sulph. gr. 1-20.	
†Scammo'nii comp.	10..20	et o'pil,	O. gr. 1-40
†Tragacan'thæ comp.	30..60	Wistar's cough lozenges.	

## TROCHIS'CI.

(The figures indicate the amount of drug in each Troch.)

†Aca'çisë,		†Ipecacuan'hæ,	gr. $\frac{1}{2}$
		†Laçtuca'riæ,	gr. 1-5
		†Limo'nis,	
		Magne'siæ,	gr. 3
		Men'thæ piperi'tæ ol.	℥ 1
		Morphiæ et ipecacuan'hæ,	
		morphinæ sulph. gr. 1-12;	
		ipecac. gr. 1-4.	
		†Mos'chi,	
		†Pectora'les Jackso'nii,	
		ipecac. gr. 1-20, morphinæ gr.	
		1-40, antimoni gr. 1-40.	

*Reduce these doses to Metric terms by multiplying Grains or Minims by  $6\frac{1}{2}$ , giving Centigrams; drachms by 4, giving Grams; Ounces by 32, giving Grams.*

†Pep'sinæ,		†Cad'mii iod'idī,	$\frac{1}{8}$
†et bismu'thi,		Canthar'idis,	$\frac{1}{8}$
†et cal'cii lactophos.		†Ceta'cei,	
†et fer'ri,		Creaso'ti,	f. 5 $\frac{1}{2}$ to 1
†Pi'cis liq'uidæ,		†El'emi,	$\frac{1}{4}$
†compos'iti,		Gal'læ,	1-7
†Podophyl'i resi'næ. gr. 1-24		†cum o'pio, G 1-7; O. $\frac{1}{8}$	
Potas'sii chlora'tis, gr. 5		Hydrargyri,	1
†et ammo'nii chlo.		ammonia'ti,	1-12
†Pru'ni Virginia'næ,		white precipitate ointment.	
†Rhe'i et potas'sii,		†compos'itum,	
rhei gr. 3; potassii bicarb. gr. 1.		iod'idī ru'bri,	1-30
Santonin'i, gr. $\frac{1}{8}$		nitra'tis,	1-13
†compos'iti,		citrine ointment.	
Santonin gr. 1-2, podoph. gr.		ox'idī fla'vi,	1-7
1-30, calomel gr. 1-2.		ru'bri,	1-7
†et podophyl. S. $\frac{1}{2}$ ; P. 1-20		red precipitate ointment.	
So'dii bicarbona'tis, gr. 3		†subchlor'idī,	$\frac{1}{8}$
Zingib'eri,	gr. $\frac{1}{8}$	calomel ointment.	

### UNGUEN'TA.

(The fractions express the proportion of *drug*, in each part of ointment.)

Unguen'tum (simple),		Iodin'i,	1-20
Aç'idī carbol'ici,	1-7	compos'itum,	1-11
tan'niçi,	$\frac{1}{8}$	Meze'rei,	$\frac{1}{4}$
†Aconi'tiæ,	1-60	Pi'cis liq'uidæ,	1
Antimo'ni,	$\frac{1}{4}$	Plum'bi carbona'tis,	1-7
tartar emetic ointment.		†açeta'tis, (about)	1-36
A'quæ ro'sæ,	?	iod'idī,	1-7
†Atro'piæ,	1-60	Potas'sii iod'idī,	1-7
Belladon'næ,	1-7	†sulphura'ti,	$\frac{1}{8}$
Benzo'ini,	1-42	Stramo'ni,	1-7
		Sul'phuris,	$\frac{1}{4}$
		iod'idī,	1-16
		Taba'çi,	1-16
		†Terebin'thinæ,	1-1
		Vera'triæ,	1-24
		Zin'çi ox'idī,	1-5

### Remarks on Pharmaceutical Preparations.

**EXTRACTA FLUIDA.** (Fluid Extracts). All officinal extracts are of the uniform strength of sixteen troy ounces of the drug to the pint, and manufacturers have generally

Reduce these doses to Metric terms by multiplying Grains or Minims by  $\frac{6}{16}$ , giving Centigrams; drachms by 4, giving Grams; Ounces by 32, giving Grams.

III. Vowels are short (1) in an accented penult, when before a double consonant (z, etc.), or any two single consonants, *except a mute followed by l, r, or h*; (2) in any other accented syllable when followed by a consonant, *except a, e, o, before a single consonant (or a mute before l, r, or h) followed by e, or i, before another vowel.*

### Rules for Genitive-Case Endings in Prescription Writing.

#### I.

Words ending in a form Genitive in æ: as, *morphia*, *morphia*. Exception: *folia*, *foliorum*.

#### II.

In *as*, by changing to *atis*: as, *sulphas*, *sulphatis*.

#### III.

In *e*, *en*, *er*, *or*, *ur*, by adding *s* or *is*: as, *æther*, *ætheris*; *sulphur*, *sulphuris*; *mite*, *mitis*; *aloë*, *aloë*.

#### IV.

In *is*, by changing to *idis*: as *cantharis*, *cantharidis*, Ex.: *cannabis*, *digitulis*, *sinapis*, *sulphis*, and a few others, have no change in form.

#### V.

In *o*, by changing to *onis*: as, *carbo*, *carbonis*. Ex.: *kino*, *condurango* have no change; *matico* is *maticæ*.

#### VI.

In *on*, by changing to *i*: as, *hæmatoxylon*, *hæmatoxyll*. Ex.: *erigeron*, *erigerontis*.

#### VII.

In *um*, *us*, by changing to *i*: as *acidum*, *acidi*. Ex.: *cornus*, *fructus*, *spiritus*, *quercus*: these remain unchanged.

#### VIII.

In *x*, by changing to *cis*: as, *calx*, *calcis*.

The following remain unchanged: *apiol*, *azedarach*, *buchu*, *catechu*, *sassafras*, *sumbul*.

... ..

### Number of Drops in 20 Minims of the Chief Fluid Medicaments.

ACIDS: acetic, 40; hydrocyanic, dilute, 15; muriatic, 18; nitric, 28; do, dilute, 17; sulphuric, 30; do, dilute, 17.

ETHER, 50.

FOWLER'S SOLUTION, 19.

OILS: essential of vegetables, 40.

TINCTURES: of all vegetables, 40; of iron, 41.

VINEGARS, 26.

Water: distilled, 15; strong of ammonia, 18; dilute of same, 15.

WINES: antimony, 24; colchicum, 25; opium, 26.

The number of drops will be found to vary with the vessel, according to the size of its neck and flange, from which the fluid may be poured.

### INCOMPATIBLES.

(See also Antidotes. For the common name of the drugs, see Dose List.

**ABSINTHIUM**: ferric and zinc sulphates; plumbic acetates; argentic nitrate.

**ACAOTIA**: alcohol; æther; lq. plumb. subacet.; tr. ferri mur. *Emulso*: acids; oxymel; scillæ syr.; potassic tartrate and bitartrate; hydrargic bichloride; spr. æth. nitrosi; all spirits; all tinctures.

**ACIDUM Aceticum**: alkalies, earths; alkaline and earthy carbonates; glycerine. *Citricum*: sulphuric and nitric acids plumbic acetates; hydrargic acetate and nitrate; alkalies and alkaline sulphurets. *Hydrocyanicum*: metallic oxides; chlorine. *Muriaticum*: alkalies; earths and their carbonates; metallic oxides and salts; potassic tartrate and sulphuret. *Nitricum*: alkalies; metallic oxides; oils; tinctures; spr. lavandulæ. *Nitro-muriaticum*: potassic and plumbic acetates; earths; alkalies; oxides; sulphurets. *Tartaricum*: alkalies and their carbonates; all potassic salts.

**ALOES** *inf. comp.*: acids; acidulous salts; metallic salts.

**ALUMEN**; carbonates of potash and soda; ammonia; magnesia; lime; galls; plumbic acetate.

**AMMONIÆ aqua**: all metallic salts; all acids; alum.

**AMMONII carbonas**: acids; potassa and liquor potassæ; alum; calcic chloride; magnesia; carbonates; potassic bitartrate and bisulphate; salts of iron, except the potassio-tartrate; hydrargic bichloride; plumbic salts; zincic sulphate; sulphur. *Chloridum*: sulphuric and nitric acids; potassa and liquor potassæ; plumbic acetate; lime; potassic and sodic carbonates. *Spiritus aromatic.*: aq. calcis; acids; acidulous and metallic salts.

**AMYGDALÆ mistura**: acids and all acidulous salts; spirits; tinctures; spr. æth. nitrosi; undistilled water.

**AMYLII mucilago**: iodine and all its preparations.

**ANGUSTURA**: antimony; plumb. acetate; bichloride of mercury; infusion of galls or cinchona; nitrate of silver; sulphates of copper and iron; tartarized antimony. *Infusum*: infus. galls and catechu; ferric and zincic sulphates; tartar emetic; argentic nitrate; plumbic acetates; hydrargic bichloride.

**ANTHEMIDIS infusum**: isinglass; infus. cinchonæ; ferric sulphate; argentic nitrate; hydrargic bichloride; plumbic acetates.

**ANTIMONII ET POTASSII TART.**: acids; earthy and alkaline carbonates; hydro-sulphurets; plumbic salts; aqua calcis; calcic chloride; bitter and astringent decoctions.

**ARGENTI NITRAS**: sulphuric, muriatic and arsenic acids and salts; alkalies (except ammon.); astringents; solutions of the salts of copper and mercury; lime; chlorides; sulphurets.

**ARMORACIÆ infusum**: infus. gallæ and cinchonæ; alkaline carbonates; argentic nitrate; hydrargic bichloride.

**ARSENICI ET Hg. IODID.**: morphic salts.

**AURANTII comp. infusum**: aqua calcis; infus. cinchonæ; ferric sulphate; plumbic acetate.

**BALSAMA** (Benzoic., Peruv., Tolu., Copaibæ, etc.): acids; alkalies.

**BARI** *lg. chlo.*: alum; argentic nitrate; potassic nitrate; sodic sulphate.

**CALCI** *lg. chloridi*: sulphuric and nitric acids; potassa, soda and their carbonates; potassic and sodic sulphate; potassic nitrate; borax.

**CALCIS LIQUOR**, acids; alkaline carbonates; tartrates; citrates; tartar emetic; infusions of orange peel, calumba, cinchona, rhubarb, and senna.

**CALUMBA**: plumbic acetates; infus. gallæ. *Infusum*: infus. gallæ and cinchonæ; antimoniac potassio-tartrate; hydrargic bichloride; plumbic acetate; argentic nitrate.

**CAMPHORÆ SPIRITUS**: water in any form.

**CAPSICUM**: argentic nitrate; alkaline carbonates; plumbic acetates; hydrargic bichloride; cupric, ferric and zinc sulphates.

**CARYOPHYLLI RUBRI** *syr.*: alkalies.

**CASCARILLÆ** *infusum*: infus. gallæ and cinchonæ; plumbic acetates; argentic nitrate; ferric sulphate; aqua calcis.

**CATECHU** *infusum comp.*: mineral acids; antimoniac potassio-tartrate; isinglass; infus. cinchonæ; ferric and zinc sulphate; hydrargic bichloride.

**CHLORAL**: alkalies.

<sup>2</sup>**CINCHONÆ** *infusum*: infus. of vegetable bitters and astringents; alkaline carbonates; aqua calcis; plumbic acetates; ferric and zinc sulphate; argentic nitrate; hydrargic bichloride; tartar emetic. *Tinctura ammoniata*: acids; earthy, metallic and acidulous salts.

**CUPRUM ammoniatum**: acids; alkalies; aqua calcis. *Sulphas*: alkalies; earths and their carbonates; plumbic and ferric acetate; borax; plumbic salts; astringent decoctions and tinctures; sulphuric acid if *acetat.*

**CYDONIÆ** *infus.*: acids.

**DIGITALIS** *infusum*: ferric sulphate; plumbic acetate; infus. cinchonæ.

**EMETINA**: all vegetable astringents.

**EXPLOSIVES**: potassic bichromate, or permanganate with glycerine; pills of "ext. nucis vomicæ, argenti nitras, morphisæ murias, gentianæ ext., et rosæ confectio"; pill of "argenti nitras and creasoti," or "argenti nitras cum acido carbolico"; all these pills contain the oximuriate of potassium.

**FERRI et potassii tart.**: infus. of astringents; potassic salts; sulphur. **Subcarbonas**: acids and their salts. **Sulphas**: alkalies and their carbonates; argentic nitrate; borax; soaps; tannin; plumbic acetate; calcic and boric chlorides; earths; vegetable alkaloids. **Mistura comp.**: acids and vegetable astringents. **Tinctura chloridi**: alkalies; aq. calcis; magnesia; alkaline carbonates; astringents; mucilage.

**GALLÆ**: alkalies and their carbonates; vegetable alkaloids; argentic nitrate; cupric sulphate; chlorides of mercury; lime-water; plumbic acetates; ferric iodide and sulphas; ant. et pot. tartras; hydrargic nitrate; infus. cinchonæ; solution of isinglass or opium.

**GENTIANÆ infus. comp.**: plumbic acetates.

**GLYCERINA**: calcic chloride; potassic permanganate; chromic acid; these, and other oxidants, form explosive compounds.

**GRANATUM**: plumbic acetates; argentic nitrate; ferric iodide and sulphate.

**GUALACUM**: mineral acids and their salts; spir. æth. nitrosi; solution of chlorine.

**HÆMATOXYLON**: mineral acids; acetic acid; alum; cupric and ferric sulphate; plumbic acetate; tartar emetic; opium; infus. cinchonæ.

**HYDRARGYRI acetas**: alkalies. **Chloridum cor.**: albumen; gluten; alkalies and their carbonates; hydrosulphates; aq. calcis; plumbic acetates; antimony; sulphates, chlorides, iodides and bromides of potassium and sodium; sulphurets; argentic nitrate; soaps; infusions of bitters and astringents; cupric and ferric salts; sarsaparilla. **Chloridum mte**: mineral acids; and same as above save the carbonates of alkalies. **Iodidum**: mineral acids; sodic

chloride; potassic iodide, unless Hg. biniod. *Oxidum*: mineral and acetic acids. *Cum cretâ*: acids and their salts.

**HYDROGEN PEROXIDUM**: vegetable tinctures; alkaline citrates and tartrates; ferric salts; hydrocyanic acid; sulphates; chlorides; nitrates.

**ICHTHYOCOLLA**: alcohol, infus. astringents; potassic carbonates.

**IPECAC**: vegetable astringents and acids; plumbic acetate.

**KINO**: mineral acids and salts; alkalies and their carbonates; plumbic acetates; ferric sulphate; argentic nitrate; tartar emetic; hydrargic bichloride.

**KRAMERIA**: see Kino.

**LINI infus. comp.**: alcohol; plumbic acetates.

**MAGNESIA**: acids; metallic salts; ammonic chloride.

*Sulphas*: plumbic acetates; argentic nitrate; aqua calcis; fixed alkalies and their carbonates; baric chloride.

**MOSCHI mistura comp.**: infus. cinchonæ; mineral acids; ferric sulphate.

**OPIMUM**; aqua calcis; alkaline carbonates; hydrargic bichloride; argentic nitrate; plumbic acetates; catechu; kino; cinchonic infus.; cupric, ferric and zincic sulphates. *Tinctura*: liq. ammoniæ; potassa, soda and their carbonates; metallic salts; astringent vegetable infusions or decoctions.

**PLUMBI acetas**: mineral acids; alum; alkalies; borax; earths; soaps; antimony; hard water; ferric tartras; aq. calcis; sulphuretted hydrogen. *Diacetatis liquor*: mucilaginous compounds; undistilled water.

**POTASSÆ LIQUOR**: acids; metallic salts; hydrargic chlorides; ammonic acetate, carbonate and muriate.

**POTASSII acetas**: mineral acids; calcic carbonate; argentic nitrate; hydrargic bichloride; decoct. tamarinds; magnesian and sodic sulphates; potassic tartrate; ammonic chloride. *Arsenitis liquor*: mineral acids; acidulous salts; hydrosulphates and sulphurets; aq. calcis; alum; calcic, ferric, cupric and argentic salts; decoc. and tinc-



tura cinchonæ; gallic acid. *Carbonas*: mineral acids; borax; ammoniac acetate and chloride; alum; magnesian sulphate; calcic chloride and carbonate; aqua calcis; all metallic salts. *Chloras*: potassic iodide (it forms potassic iodate in the stomach); is not safely combined with any substance capable of easy oxidation. *Iodidum*: acids; metallic salts that are not iodides. *Nitras*: alum; all metallic sulphates; sodic and magnesian sulphates; sulphuric acid. *Sulphas*: nitric, muriatic and tartaric acids; hydrargyric and plumbic salts; argentic nitrate; calcic chloride. *Sulphuretum*: acids; metallic, acidulous and earthy salts. *Tartras*: acids; infus. tamarinds and acid fruits; calcic chloride; lime; magnesia; magnesian, sodic and potassic sulphates; argentic nitrate; plumbic acetate; ammoniac muriate. *Bitartras*: mineral acids; alkalies and alkaline earth.

QUASSIA: argentic nitrate; plumbic acetate. *Infusum*: ditto.

QUININÆ *sulphas*: alkalies and their carbonates; lime; lime-water; salts of baryta and lead; argentic nitrate.

RHEI *infusum*: isinglass; mineral acids; argentic nitrate; plumbic acetates; ferric sulphate; tartar emetic; magnesia; hydrargyric bichloride; infus. cinchonæ.

ROSÆ *infusum*: earths; alkalies; ferric and zinc sulphate.

SALIX: aq. calcis; ferric sulphate; alkaline carbonates; isinglass.

SAPO: acids; earths; alum; metallic salts; astringents; hard water.

SARSAPARILLÆ *infus. et decoct.*: aqua calcis; plumbic acetates.

SCILLA: alkaline carbonates; aqua calcis; argentic nitrate; plumbic acetates; gelatin.

SENNÆ *infusum*: all potassic salts.

SERPENTARIÆ *infusum*: mineral acids; aqua calcis; alkaline carbonates; argentic nitrate; plumbic acetates; hydrargyric bichloride; infus. cinchonæ; tartar emetic.

SODII *acetat*: mineral acids; calcic carbonate. *Car-*

*bonas*: same, with earthy and metallic salts; ammoniac chloride. *Phosphas*: alum; calcic carbonate; all salts with an earthy base. *Sulphas*: baric and calcic chlorides; potassic carbonate; salts of lead and silver. *Potassio-tartras*: mineral acids; acidulous salts, save potassic bitart.; plumbic salts; calcic chloride. *Sulphites*: all acids.

**TAMARINDUS**: potassic and sodic carbonates and acetates; infus. sennæ; resinous cathartics.

**TARAXACUM**: argentic nitrate; ferric sulphate; plumbic acetates; hydrargic bichloride; galls.

**TRAGACANTHA**: cupric and ferric sulphate; plumbic acetate.

**ULMI infusum et decoct.**: alcohol; tinctures, if to any great amount.

**UVA URSI**: ferric and plumbic salts; argentic nitrate; tartar emetic; infus. cinchonæ; opium: ipecacuanha; alkalies; with spr. æth. nitrosi, it is said to form an explosive mixture.

**VALERIANA**: ferric salts; argentic nitrate; infus. cinchonæ.

**VIOLÆ syrupus**: acidulated and alkalinized fluids destroy its blue color.

**ZINCI sulphas**: alkalies; astringent infusions; earths; hydrosulphates; aq. calcis; milk; ammoniac carbonate.



## Poisons and their Antidotes.

(For common name of the drugs, see Dose List).

**GENERAL TREATMENT**: I. Emetics, or stomach pump. II. Cathartics, when the poison is supposed to be in the intestinal tract. III. Artificial respiration. IV. Stimulents, diluents, and frictions to the surface of the body. V. When the nature of the poison is unknown, the following will be a harmless, yet to most poisons, efficacious antidote.: *R.* Magnesiæ, carbonis ligni, ferri oxidi hydrati, ana equal quantities; aquæ q. s. Administer *ad libitum*. Or, the following, (J. Jeannel's): Persulphate

of iron solution (density 1.45) 100 parts; Water, 800 parts; Calcined magnesia, 80 parts; Animal charcoal, 40 parts. The iron solution should be kept in a separate bottle from the mixture of the other three substances, and should be added to it immediately before using. This mixture acts as a perfect antidote to arsenic, and is preferable to ferric hydrate, because the latter deteriorates upon keeping. It also acts as a perfect antidote for compounds of zinc, and digitaline, and nearly so for those of copper. It delays considerably the action of salts of morphia and strychnia, and to a slight extent that of compounds of mercury. It has no virtue in counteracting the effect of cyanide of mercury, tartar emetic, hydrocyanic acid, phosphorus or the caustic alkalies. VI. A freshly prepared mixture of the sulphide of iron, magnesia, and sulphate of sodium, acts as a perfect antidote for salts of copper, corrosive sublimate and cyanide of mercury. VII. Dr. Bellini, Professor of Toxicology at the Royal Institute at Florence, recommends iodide of starch as a valuable antidote in poisoning by alkaline and earthy sulphides, caustic alkalies and ammonia, and the vegetable alkalies. In poisoning by alkaline or earthy sulphides, he thinks it preferable to all other antidotes; in poisoning by caustic alkalies, it is applicable when acid drinks are not at hand.

*ACIDUM hydrocyanicum*: inhalations of ammonia and chlorine; cold *douche*; ferric sulphate; sodic bicarbonate, atropia hypodermically. *Muriatic.*, *Nitric.*, and *Sulphuricum*: albumen; carbonates of magnesium, calcium, potassium, sodium; chalk, soap or whiting in milk; *no water* in sulphuric cases; oil. *Oxalicum*: chalk; lime-water; magnesia; avoid all alkaline carbonates. *Aceticum*: magnesia or its carbonates. *Carbolicum*: solution of saccharate of lime; olive or almond oil; lard

*ACONITUM*: (see Belladonna); digitalis; stimulants.

*ALKALIES*: vegetable acids; fixed oils.

*ALUMEN*: carbonates of ammonium, potassium, etc.

*AMYL*: hyponitrous ether (Squibb).

## POISONS AND THEIR ANTIDOTES.

**ANTIMONIUM:** astringent infusions; carbonates of magnesium and sodium; milk.

**ARGENTUM:** albumen; milk; sodic chloride of *nitras*.

**ARSENICUM:** albumen; ferri oxidum hydratum; magnesia; mixture of oil and lime-water. See V. gen'l treatment. (a.) Hydrated sesquioxide of iron recently prepared (gelatinous and brown) is an antidote for arsenious acid, but *not* for the arsenite of potash, *nor* for the arsenite of soda, (b.) At a longer interval than an hour it is useless to attempt recovery from poisoning by arsenic. (c.) For arsenite of potash, and arsenite of soda the author proposes perchloride of iron in conjunction with magnesia. (d.) The mode of administration is the officinal solution of perchloride of iron, and, a half an hour after, magnesia in the proportion of a drachm to  $3\frac{1}{4}$  fl. ozs. of perchloride. (e.) This perchloride of iron and magnesia is also an antidote for arsenious acid. Therefore, it is preferable to employ it always in cases of poisoning by arsenic or its compounds. (f.) An hour after the administration of an antidote, it will always be well to employ a purgative, in order to expel the ferrated arsenite which is formed, and as this arsenite is soluble in acids, to avoid acid drinks and lemonades. (M. Rouyer).

**AURUM:** ferric sulphate; mucilage.

**BARIUM:** sulphates of calcium; magnesium, potassium and sodium; fixed oils.

**BELLADONNA** and its allies, **HYOSCYAMUS** and **STRAMONIUM:** ammonia; astringent infusions; coffee; cold to head; electricity; flagellation; opium; pepper; stimulants; oleum sassafras.

**BISMUTHUM:** albumen; milk; sugar; mucilage.

**BROMAL-HYDRATE:** atropia, belladonna, etc.

**CALCI** *chloridum*: albumen; mucilaginous drinks; oils; milk; flour and water; *no acids*.

**CAMPHORA:** stimulants; wine; opium.

**CANTHARIS:** camphor; copious draughts of milk; mucilaginous or oleaginous fluids; broths; enemata of demulcents; opium.

**CHLORAL:** *hot bath or pack*; frictions; stimulants; artificial respiration; coffee.

**CHLOROFORMUM, ÆTHER and AMYLENE:** plenty of air; hot cloths above the heart; cold affusions; coffee; flagellation; electricity; injection aromatic spr. ammoniæ; artificial respiration (see asphyxia below); tongue should be held well forward by forceps. Schüller has recommended nitrite of amyl as antidote to chloroform. Nélaton's method of *inverting* the patient, having tongue drawn forwards, and then compressing and relaxing the chest. Keep patient in this position till breath and pulse are good.

**CREASOTUM:** albumen; gluten; milk; oil; flour.

**CUPRUM:** albumen; gluten; milk; sugar; ferrocyanide of potassium; *no vinegar*. (See VI. general treatment).

**FERRUM:** carbonates of ammonium and sodium; magnesia; mucilaginous drinks.

**GAMBOSIA:** potassic or sodic carbonate, or magnesia, in milk; mucilaginous drinks; opium.

**GASES:** *carbonic acid*, galvanism; inhalation of oxygen; artificial respiration. *Sulphuretted hydrogen:* chlorine gas well diluted with common air.

**GLASS,** coarse or in powder: much bread, in crumbs, to envelope it, following with emetics.

**GELSEMIUM:** Morphia has been proposed.

**HYDRARGYRUM:** albumen; yolk of egg; vegetable astringents; gluten; flour; milk; after-treatment, potassic iodide; the hydrated protosulphuret of iron, if given in 20 minutes, is reported to be a proper chemical antidote. (See VI. general treatment).

**IODINIUM:** starch or flour given in water.

**MEZEREUM:** albuminous and mucilaginous drinks; milk; oils and fats; albuminous eremata; cool poultices to abdomen, etc.; opium.

**OLEUM AMYGDALÆ AMARÆ:** see acidum hydrocyan.

**OPIUM:** veg. astringents; belladonna; coffee; cold *douche*; flagellation; hyoscyamus; artificial respiration;

stramonium; faradic current to phrenic nerves; epispastics; stimulants; comp. tr. iodinii; oxygen gas.

PETROLEUM: evacuate the stomach; stimulants; cold affusions; friction to extremities; coffee; artificial respiration.

PHOSPHORUS: cupric sulphate; magnesia; carbo animalis; mucilaginous drinks; liq. calcis. *Avoid all oleaginous mixtures.*

PLUMBUM: albumen; alum; milk; soluble alkaline and earthy sulphates; potassic iodide as after-eliminate.

POTASSII bromidum: nervous stimulants; brandy; opium. Nitras: emetics; milk and mucilaginous drinks; opium; aromatics; emollient enemata.

QUINIA: emetics and cathartics; opium; coffee; brandy or wine; diffusible stimulants; diuretics and sudorifics as after-eliminatives.

STANNUM: albumen; ammoniac and sodic carbonates; milk.

STRYCHNIA: chloroform; lobelia; opium; tobacco; tannin in excess; gallic acid; chloral hydrate; potassic bromide; monobromated camphor; *hot* bath; *forced* insuflation of air; olive oil or lard.

VERATRUM VIRIDE: stimulants; digitalis; opium.

VEGETABLE. generally albuminous or mucilaginous drinks; oils, etc.; stimulants; opium; soothing clysters; ice; cool poultices to abdomen, etc.

ZINCUM: albumen; mucilaginous drinks; milk; potassic and sodic carbonates; tannin.

### MISCELLANEOUS.

BEEES and INSECTS: aq. ammoniac; solution of sodic bicarbonate or chloride, or carbolic acid, applied to the wound, or 15  $\mu$  of a 2 per cent. solution hypodermically; lq. am. acetatis internally.

MUSHROOMS: after general treatment, stimulants, unless inflammatory symptoms present themselves. Tannic acid has been recommended.

# POISONING AND THEIR ANTIDOTES.

**WOUND** (see application of diluted carbolic acid.)

**WOUNDS** (see treatment of these above wound) ; cleanse thoroughly ; cauterize with strong carbolic or the mineral acids ; administer internally ammonia, spirits, frumenti, phosphorus, and bisulphate, or *agave Americana*. Hammond recommends the following : ℞. Potassii iodidi gr. iv ; ℥ss. oil. cor. gr. ij ; Brandy, ʒv ; Aquæ, ʒj ; 10 drops in ʒss of brandy ; to be repeated if necessary.

**WOUND**, *Pain*, etc. : capsicum ; chloroform ; potassic chlorate freely ; liq. am. acetatis ; opium.

**WOUNDS** : *dressing*, cleanse thoroughly by letting a stream of water run upon it, and if necessary, ligature the member above the wound ; this done, cauterize with carbolic acid ; poultice ; ammonia and quinia internally. *from rabbit animals* : wash, or suck out, at once ; cauterize with argentic nitrate, potassa, or the mineral acids ; keep up bleeding by cupping and warm water ; when slough separates, keep up suppuration ; belladonna and opium may be given internally.

**ASPHYXIA** and **APNŒA**, *from drowning* : 1. Give the patient plenty of fresh air, fully exposing neck and chest to the breeze, unless inclement. 2. Turn gently on the face, one forearm being under the forehead, and raise the body up, keeping the head down, that the water may have free discharge from the mouth ; or, place the body, belly down, across a barrel, and gently roll back and forth a few times. 3. Place patient upon the side and apply stimulants (ammonia, etc.) near the nostrils ; or, the cold douche, in order to excite respiration. 4. Gently turn patient from partially on his face (the arm being under the forehead) to the back ; then to the face again, and so on, deliberately and preservingly, and not oftener than *eighteen* times per minute. When patient is on his face, make even and steady pressure along the spine, removing it before turning upon the back ; and when there, make slight pressure upon the chest, removing this, also, before turning upon the face. 5. Or, the following mode of artificial respiration (Silvester's) might be employed :

Having laid the patient upon his back, raise the arms up by the side of his head, keeping them straight, and having the tongue pulled well forwards; then bring them down to the side, slightly crossing the chest with them, making, at the same time, slight pressure thereon; continue these movements deliberately and carefully, and not oftener than *eighteen* times per minute. In 4, when the patient is on his side, and in 5, when the arms are above the head, artificial inflation should be performed. 6. Or the following, which is recommended by the trans-Atlantic journals: Having placed the patient upon his back, with a firm roll of clothing under the false ribs, so as to throw their anterior margins well forwards, an assistant brings the tongue forwards, whilst the operator, facing the patient, kneels astride his abdomen, and places both hands so that the balls of the thumbs rest upon the anterior margins of the the false ribs, the fingers falling into the corresponding intercostal spaces. With the elbows of the operator pressing firmly against his side, he throws himself forwards, using his knees as a pivot, forcing the false ribs towards each other, and upward and inward. This contracts the pulmonary space to the greatest possible extent. The operator then suddenly removes the pressure, the inrush of the air and the elasticity of the rib-attachments force them out again, causing, by the diaphragm's descent, an inspiration. Continue this not oftener than eighteen times per minute. 7. Having performed (2) several times, lay the body face down, the head upon the arm, and stand astride it; grasp it then about the shoulders and armpits, and raise the chest as high as you can without lifting the head quite off the arm, and hold it about three seconds; then replace the body upon the ground, and press the lower ribs downwards and inwards, with slowly increasing force for ten seconds: then suddenly let go, to perform the lifting process again. 8. Laryngotomy or tracheotomy, with or without catheterization, or forced insufflations of air or *oxygen*. 9. Fric-



tions, fomentations, sinapisms, dry and warm clothing.

10. Electricity; stimulants internally.

*From strangulation*: rules 3, 4, 5, 6, 7, 8, 9 and 10.

NOTE.—In artificial *inflation*, always press the larynx and trachea against the vertebral column, so as to close the œsophagus, and thus prevent the air entering the stomach.

### TESTS.

**ACIDUM hydrocyanicum**: odor of bitter almonds; to the liquid add a few drops of potassic lq., and afterwards a solution of ferric protosulphate, when a *brown* precipitate will fall, which, on the addition of sulphuric acid, instantly changes to a bluish-green, and finally to a full *blue*.

**Muriaticum**: add a solution of argentic nitrate to the fluid, which gives a *white* precipitate, soluble in lq. ammoniæ, and insoluble in nitric acid; dense *white* fumes from the vapor of lq. ammoniæ.

**Nitricum**: boil over filings of copper, when dense *orange* fumes will be given off; stains all albuminoid substances *yellow*; *reddens* morphia and its salts.

**Oxalicum**: intensely sour; oxalate of lime formed on addition of lq. calcis, which is insoluble in an excess of the alkali, but soluble in nitric acid; readily volatilize by heat, subliming in small crystals.

**Sulphuricum**: soapy feel between the fingers; heat evolved on mixing with water; sulphurous acid gas on boiling with mercury.

**ALKALIES** (lq. ammoniæ, potassæ, sodæ): not precipitated on the addition of solution of potassic carbonate, as are the solutions of alkaline earths; soapy between the fingers; they *blue* reddened litmus paper.

**ANTIMONIUM**: odor of burnt vegetable matter on subliming with charcoal, the powder at first blackening, then whitening, and finally showing the metal; to the solution add Tr. gallæ, which gives a dense *whitish-yellow* precipitate; sulphuretted hydrogen gives a *crimson* or *orange* precipitate.

**ARGENTI nitras:** piece of phosphorus precipitates from the solution of the metal; solution of arsenious acid in lq. ammoniæ, when added, gives a *yellow* precipitate; all the hydro-chlorates precipitate a *white* powder, which *blackens* by light.

**ARSENICUM:** sublimed on charcoal or red-hot iron gives *garlic odor*; heated in glass-tube with charcoal it sublimes and condenses into metal; sulphuretted hydrogen gives *yellow* precipitate; ammoniated solution of argentic nitrate gives *yellow* precipitate; ammoniated solution of cupric sulphate gives *green* precipitate; boil with muriatic acid, and put in a *bright* piece of copper, the metallic arsenic immediately coats the bright surface; Marsh's test with nascent hydrogen.

**BARIIUM chloridum:** drop in the suspected fluid a few drops of sulphuric acid, when a *white* precipitate falls, *insoluble* in nitric acid; mixed with a solution of argentic nitrate, a *curdy white* precipitate forms, that is *insoluble* in nitric acid, but *soluble* in lq. ammoniæ; if in a colored menstruum, this is to be bleached with chlorine, the chlorine being driven off by heat before the last test can be applied.

**BRUCIA:** dissolved and colored *blood-red* by nitric acid, which is changed to *deep violet* on the further addition of a solution of a protochloride of tin.

**CANTHARIS:** shining *green* particles of the drug when undissolved; water precipitates (*white*) the alcoholic solution, which is afterwards soluble in an excess of water.

**CARBONIC ACID gas:** extinguishes the candle when the proportion is from 12 to 15 *per centum*, the smoke being seen to float upon the stratum of the gas; agitating lq. calceis or solution of subacetate of lead in this gas (when much above 1 *per centum* present) produces a *white* precipitate in the liquids; agitating a *blued* (by litmus) solution of chloride of lime in the gas, the color is discharged, thus differentiating from nitrogen.

**CREASOTUM:** peculiar *smoky* odor; instantly coagulates albumen.

## TESTS.

**CUPRUM:** all cupric salts, in solution, or otherwise, are *blue* and *green*; solutions generally have acid reaction; lq. ammoniæ, added to a suspected solution, gives a *bluish-white* precipitate, soluble in an excess of the ammoniæ, giving a *violet-blue* solution, if copper be present; potassic ferrocyanate gives a *claret-red* precipitate, or a *reddish-brown* color if the cuprum is present only in small quantities; sulphuretted hydrogen gives a deep *chocolate-brown* precipitate; polished steel speedily coated with the metal if suspended in the solution; pour some on a platina plate, acidulate with nitric acid, then touch the platina, passing through the fluid, with a slip of zinc, when a deposit of copper upon the platina takes place.

**FERRUM:** the soluble salts strike an *inky* color (and taste) when brought in contact with an infusion of galls.

**HYDRARGYRI chlo. cor.:** lq. calcis, or lq. potassæ gives an *orange-yellow* precipitate; solution of potassic iodide gives a *scarlet* precipitate (Hg. I<sup>2</sup>); put the powder (if poison in that form) with dry potassic carbonate into test-tube and heat to redness, mercury will be obtained in globules; place a gold coin, wrapped around with a bright copper wire, in the suspected fluid, the *white* coating upon the coin assumes metallic lustre on rubbing if cor. sub. be present; drop a little of the fluid upon a bright gold surface, touch it, through the liquid, with the point of a knife, when an amalgam is formed; solution of protochloride of tin to be added gradually, the precipitate is to be carefully washed, when a globule of mercury will remain. *Iodide:* apply some of the above tests for the mercury, and in addition heat in glass-tube, when the *purple* vapor of iodine will be driven off for the protoiodide, and a *yellow* vapor (changing to *red* as it cools) for the biniodide.

**IODINIUM:** *purple* vapor on sublimation; added to starchy solutions and mucilages it strikes a purple color. *Potassic iodide:* solution of hydrargic bichloride gives a *scarlet* precipitate; mixed with starchy solution, and

treated with chlorine gas or nitrous acid, a *blue* color is produced.

**MORPHIA:** nitric acid, in excess, to quite a strong solution, or powder, produces an *orange-red* color (make this test only to cold solutions); solution of ferric chloride, neutralized by potash, gives an *inky-blue* color to a solution of morphia (not to be applied to a very acid or hot liquid); mix iodic acid with starch, when a *purplish* or *deep purple* color is produced (not to be applied to hot or very acid liquids).

**NUX VOMICA:** aqueous infusion gives a bright *red* tint on addition of nitric acid; a *green* color by addition of ferric chloride.

**OPIMUM:** same as for morphia; ferric chloride turns an aqueous solution to a *deep red* color.

**PHOSPHORUS:** its peculiar odor and combustible properties.

**PLUMBI carbonus:** powder rubbed in mortar with tr. gualaci and a few drops of lq. ammoniæ, a *green* color is produced; reduce to metallic state on charcoal; if in colored solutions, decolorize by chlorine, when a solution of potassic sulphate will give a *white* precipitate; sulphuretted hydrogen, a *black* precipitate; potassic chromate, a *yellow* precipitate; dissolve in acetic acid, add potassic iodide, and a *yellow* plumbic iodide will fall. The above answers, generally, for other plumbic preparations as a *lead* test.

**POTASSII bromidum:** starch or mucilage colored *yellow*; take up the bromine with æther, then drop into this a solution of argentic nitrate, when a *whitish-yellow* precipitate, insoluble in nitric acid or lq. ammoniæ, falls; sulphuric acid, in a colorless solution, sets bromine free, giving the odor and color (*deep red*) to the liquid. *Nitras:* deflagrates when thrown on "live coals"; gives off nitrous acid fumes when hot sulphuric acid is poured upon it; if poison in solution, sprinkle morphia over the surface, then add a little sulphuric acid, if niter present

the morphia changes to a red color from the action of ~~free~~ nitrous acid; add to the solution sulphuric acid and potassium sulphate of iron, the nitric acid disengaged will darken the solution.

**STANNI chloridum:** lq. potassæ and potassic ferrocyanide give white precipitates; hydrosulphurets, yellow precipitates; hydrarg. bichlo., a gray precipitate; argent. chlo., a white, curdy precipitate, soluble in lq. ammoniæ, but insoluble in acids.

**ZINCI sulphas:** potassic chromate precipitates the yellow zincic chromate.

**[NOTE.]—How to distinguish the alkaloids:** Treat the powder with nitric acid which is colored red by Brucia, Delphia, Morphia, and (impure) Strychnia; if the reddened substance becomes of a violet color by adding stannic chloride it is BRUCIA; if it become black, it is DELPHIA; if soluble, evolving free iodine when iodic acid is introduced, it is MORPHIA; if not soluble and will not decompose iodic acid, it is STRYCHNIA. If nitric acid greens the powder, it is SOLANIA; if insoluble in æther, and does not redden nitric acid, it is EMETIA; if soluble in æther, does not redden nitric acid, is volatilized, it is ATROPIA; if thus affected by æther and nitric acid, but is not rendered volatile, it is VERATRIA.

**A. Husemann's Test for Morphia** is asserted to be exceedingly delicate, as small a quantity as 0.00001 gm. (=  $\frac{1}{5400}$  gr.) of morphia being said to be recognizable, even in presence of organic coloring matter. It consists in heating the suspected liquid to 150°, or thereabouts, for a few moments with concentrated sulphuric acid, leaving it to cool, and adding a trace of sodium hypochlorite, potassium chlorate, or chlorine water: a beautiful blue—to violet-red color—then appears, which soon changes to blood-red and finally disappears.

### Tests for Urinary Deposits.

**APPARATUS:** A nest (12) of test-tubes; test-tube holder, wood preferred; rack for test-tubes; alcohol lamp; small porcelain dish; 2 watch crystals; platinum-foil sheet, say  $\frac{3}{4}$  inch square; 2 pipettes, one larger than the other to be used only for urine; 2-oz. graduate; urinometer; blue

and red litmus paper. The reagents are indicated in the several tests. The expense for an apparatus like the above, which is complete enough for any ordinary work, will be in the neighborhood of \$5.00.

**QUANTITY:** In health the average quantity of urine passed in the twenty-four hours by an adult is about 50 *fluid-ounces*, though there may be a considerable variation from this amount.

**REACTION:** this is always *acid* in a twenty-four hours' collection, in health. May be alkaline from effect of remedies administered, disease, or a meal.

**SOLIDS** in each ounce of urine: Take the Sp. Gr. with the urinometer; the last two figures of this will give you the amount of solids in each fluid-ounce. *Example:* Normal urine is 1.018; hence there are 18 grains of solids in each fluid-ounce. Normally there are from 600 to 700 grains of solids excreted in a day.

### CHEMICAL TESTS.

1. **SPECIFIC GRAVITY**, *normal*, 1.018: **HIGH**, urine dark colored, urea, or uric acid; light colored, sugar; **LOW**, urine pale colored, water.

2	{	Deposit white.....	(3)
		precipitated by heat.....	(4)
		colored.....	(7)
3	{	soluble by heat.....	urate of ammonia
		insoluble or deposited by heat.....	(4) (5)
4	{	soluble in dil. nitric acid.....	phosphates (2)
		insoluble in do.....	albumen
5	{	soluble in liq. ammonia.....	cystine (13)
		insoluble in do.....	(6)
6	{	soluble in acetic acid.....	earthy phosph's. (12)
		insoluble in do.....	oxalates (14)
7	{	crystals insoluble by heat.....	uric acid (9)
		amorphous, pale, soluble by heat.....	urates
		dark, soluble by heat.....	urates

8. **ALBUMEN:** precipitated by heat (2), (3), nitric acid and alcohol. Care should be had in the heat test, that the urine have an acid reaction before it is applied; if the

urine be alkaline, acidulate by a few drops of acetic acid, before boiling. Excess of nitric acid also prevents coagulation by heat. Tube to be one-third filled with deep yellow solution of picric acid (Galipe's test) and to this add a few drops of suspected urine: if albumen present, immediately there appears a sharply marked white cloud, that by heat is made to coagulate. Phosphates or urates do not interfere with this test.

8. URIC ACID: slowly precipitated by muriatic and nitric acids; soluble in liq. potassæ (7). Place a little of the deposit upon the platinum-leaf and add a drop of nitric acid to dissolve it, and then carefully evaporate. When dry add a few drops of liq. ammonia, when a beautiful *purple* color will be developed in it.

10. MUCUS: urine generally cloudy,ropy and alkaline; coagulated by acetic acid, in fine fibrillated bands; this is made more distinct by the addition of a little iodine and potassic iodide to the acid.

11. PUS: urine generally acid; pus falls to the bottom of the vessel; liq. potassæ form gelatinous mass resembling mucus; is albuminous (8); acetic acid actionless (10); saturated alcoholic solution of guaiacum exposed to air until it will turn green on coming in contact with potassic iodide; a few drops of this upon pus, moistened with water, strikes a *blue* color.

12. PHOSPHATES: *Earthy, white* precipitate by liq. ammoniæ or liq. potassæ, which is soluble in all acids, but not by heat. Their approximate quantity is found by adding, to a test-tube one-third filled with the clear urine, a few drops of the alkali, and then gently heating. In fifteen or twenty minutes, if the layer of precipitate is found to be about one-third of an inch in height, they are about normal. Great variation from this will indicate their superabundance or deficiency. *Alkaline, yellow* precipitate by argentic nitrate, which is soluble in liq. ammoniæ and dil. nitric acid; obtained by filtering off the earthy; the alkaline phosphates then being precipitated by a saturated

solution of magnesii sulphas. It is really unnecessary to filter off the earthy phosphates in order to get an "approximate quantitative estimate" for ordinary purposes. To get this, add to a given quantity of the urine one-third as much of the following: Equal parts magnesian sulphate, ammoniac chloride and liq. ammoniac, to eight parts of distilled water; if the result is a *milky-like* cloudiness of the whole, then they are in normal quantity; if *cream-like* in excess.

13. **CRYSTINE**. Precipitated by ammoniac carbonate and acetic acid; soluble in liq. ammoniac (5), liq. potassæ, mineral acids, though insoluble in vegetable acids, and by heat. Is a pale or *fawn-colored* deposit. Urine has the odor of sweet-brier [4].

14. **OXALATE OF LIME**: condense by evaporation and use microscope [3]; insoluble in acetic acid (6) and liquor potassæ; soluble in mineral acids; sp. gr. high; urine contains an abundance of epithelial cells and urea.

15. **HIPPURIC ACID**: condense by evaporation, add a few drops of muriatic acid, and you get the characteristic (microscopical) twig-like crystals; urine light colored and odor of whey; sp. gr. low.

16. **SUGAR**: (1): quantity of urine generally greatly increased. (Before applying any of these tests, albumen, if present, should be coagulated and removed by filtration.) Liq. potassæ with heat turns urine deep brown, and if to this a few drops of nitric acid be added, the coloration disappears, and an odor similar to burnt molasses is developed. Take of urine and the following equal parts:  $\mathfrak{R}$ . Potassii bitart., gr. 96; sodii carb., gr. 96; cupri sulph., gr. 32; potassæ, gr. 64; aquæ, f 3 2; boil and you have a *red* precipitate (cupri suboxid.) if sugar be present. (This detects where Trommers' fails.) To the suspected urine add one-half as much liq. potassæ, and to this a few grains of bismuthic subnitrate, then shaking and boiling; if sugar be present the *black* metallic bismuth will be found deposited upon the sides of the test-tube. (Boetger's test.) — Vidan



yellow residue, after evaporation, changes to a *red* on addition of solution of soda.

**URÆMIA:** it is said that a piece of glass moistened with sulphuric acid and held to the escaping breath of such a patient, gives a white deposit upon the glass.

**ALKALINITY:** dependent upon a *fixed alkali*, the test-paper undergoes no change by drying; if on *ammonia*, test-paper changes to the original red color.

**NOTE.**—*Heat* only dissolves urates; *potash*, all deposits but the phosphates, and the oxalate of lime; *muriatic acid*, generally all deposits but uric acid. In all tests where reagents are employed, only a few drops of the reagent designated should be used to a test-tube one-third filled with the urine to be examined.

#### MICROSCOPICAL.

1 {	Deposit amorphous.....	[2]
	crystalline.....	[3]
2 {	sol. in lq. potassæ.....urate of ammonia	
	insol. in do.....phosphate of lime	
3 {	Crystals octahedral.....oxalate of lime	
	not do.....	[4]
4 {	6-sided laminæ sol. in lq. am.....cystine	
	not do.....	[5]
5 {	sol. in acetic acid.....	[6]
	insol. in do.....	[8]
6 {	penniform or prisms.....nut'l. trip. phosph.	
	radiated or foliated.....	[7]
7 {	sol. in acet. acid with efferv.....carb. lime	
	do without efferv.....bibas. trip. phosph.	
8 {	dumb-bell or radiated.....oxalurate lime	
	spherical or colored.....	[9]
9 {	lozenge-shaped.....uric acid	
	spherical.....urate of soda, or ammonia	

**MUCUS CELL:** granular and spherical, slightly larger than blood corpuscle, being about the 1-2500 of an inch in diameter. Contains one or more nuclei with nucleoli.

**PUS CELL:** resembles the mucus so closely that it is hard to draw the line between them. The chemical tests (10) and (11), will be needed to differentiate them.

**RENAL CASTS:** epithelial, granular, oily, waxy or bloody in their contents; vary from 1-300 to 1-1000 of an inch in diameter.

**EPITHELIUM:** *round*, from the kidneys and deeper layers of the bladder; *columnar*, or *conical* from the ureters or urethra; *scaly*, from the superficial layer of the bladder or vagina, the latter producing the larger and flaky aggregations.

**SPERMATOOZOA:** apple-seed shaped bodies, with long caudal filaments.

**FUNGI:** *Bacteria*, trembling points (monads); vibrating lines of length of blood-corpuscle (staff-shaped); two or more of the staff-shaped joined together (vibrios); punctiform masses held together by some gelatinous substance (zoöglea-form). *Yeast* (*torulæ*), granular spores, or chain-like aggregations of cells. *Sarcinæ*, cuboids, or chains of cuboid cells, showing segmentation into cubes.



## Obstetric Department.

### CALENDAR.

**RULE.**—*Look in the first column for the month in which menstruation ceased; add to the day of the month on which this occurred 6, and the corresponding date in the month opposite this one will be the time for expected confinement.*

**EXAMPLES:** suppose menstruation ceased on the 3d of August; add to this 6, thus making 9; hence, the 9th of May following will be the expected day for confinement. Suppose it ceased on the 29th of September; adding 6, we have the 5th of October; the date opposite will be the date of confinement, viz.: the 5th of July.

January .....	October	July.....	April
February ...	November	August.....	May
March.....	December	September .....	June
April.....	January	October.....	July
May.....	February	November .....	August
June.....	March	December.....	September

**EXTERNAL MEASUREMENTS OF NORMAL PELVES.**

Tub'osity ischii to post. sup. spin. proc. op. side,	6½ in.
Ant. sup. spin. process to do.....	7¾ in.
Trochanter major to do.....	8¾ in.
Ant. sup. spin. proc. to spine last lumb. vertebra.....	6¾ in.
Symph. pubis to post. sup. spin. proc. same side.....	6¾ in.

A variation of one-half an inch, in any *two* measurements, from those above given, indicates deformity.

**INTERNAL DIAMETERS OF NORMAL PELVES.**

These measurements are the *mean* of those given by twenty of the leading foreign and American authors.

INLET: antero-post., 4.16 in.....generally given as 4		
Transverse.....	5.08.....	5
Oblique.....	4.79.....	5
OUTLET: transverse 4.15.....		
Antero-posterior.....	4.16.....	4
Oblique.....	4.41.....	

The antero-posterior diameter of outlet is increased from one-half to one inch, and the oblique one-fourth in., by the mobility of the coccyx.

**SMALLEST ANTERO-POSTERIOR DIAMETER ADMITTING PASSAGE OF A LIVING CHILD AT TERM.**

3½ in.—Burns, Clarke, Ray.
3 in.—Aitken, Bedford, Burch, Cazeaux, Davis, Denham, Meigs, Osborn, Ramsbotham.
2¾ in.—Barlow, Bush, Hamilton.

**DIAMETERS OF FETAL HEAD AT TERM.**

These measurements are the *mean* of those given by nine of the leading foreign and American authors.

Occipito-frontal .....4.50 in.	Biparietal.....	3.61 in.
Occipito-mental.....5.16 in.	Trachelo-bregmatic.....	3.75 in.
Fronto-mental.....3.68 in.	Suboccipital.....	3.50 in.
Bitemporal.....		3.04 in.

**SHORTEST DIAMETER ALLOWING EMBRYOTOMY.**

2¾ in.—Busch (2½), Churchill, Meigs.
2½ in.—Bedford, Cazeaux, Dubois.
2 in.—Dewees, Hull, Jacquemier, Burns?, Campbell?.
1½ in.—Barlow, Hamilton, Osborn, Ramsbotham.

## SIZE OF FŒTUS AT DIFFERENT PERIODS.

- 1st mo. *ovum* the size of pigeon's egg.  
 2nd " size of hen's; embryo 1.2 in. long; weighs 62 gr.  
 3rd " size of goose's; embryo 2.7...3.5 in. long; 310 gr.  
 4th " *fœtus* 6.6 in. long; wt., 1,860 gr.; sex determinable.  
 5th " length, 7...10.3 in.; weight, 4,400 gr.  
 6th " length, 11...13 in.; weight, 9,827 gr.  
 7th " length, 13...15 in.; wt., 42 oz.; may live few days.  
 8th " length, 15...17 in.; weight, 49 oz.  
 9th " length, 16...17 in.; weight, 49 oz.  
 Term, length, 20 in.; weight, 7 lbs.

**PREGNANCY, EVIDENCES OF:** *Presumptive*—1. Suppression of menses. 2. Nausea and vomiting (ceasing before quickening). 3. Depraved appetite. 4. Salivation. 5. Changes in breast, nipple, etc., in color of vagina, and production of chloasma uterinum.

*Probable*—1. Changes of uterus and abdomen; (a) descent of uterus the first two months, and inclination of neck to left side; (b) rising in abdomen at third month, with a right lateral obliquity; (c) fourth month, fundus midway to umbilicus; (d) fifth month, on level with umbilicus; (e) sixth month, two fingers' breadth above umbilicus; (f) seventh month, midway to sternum; (g) eighth month, nearly to sternum, with cough and palpitation; (h) ninth month, settling of womb. 2. Changes in position of urethra, being drawn up with the uterus. 3. Œdema of lower extremities. 4. Changes of neck of uterus, as becoming patulous, with glandular secretion.

*Positive*.—1. Quickening, average time being at 4½ months; is to be distinguished from assumed. 2. *Ba'to'te'ment*, though no proof against pregnancy if not elicited. 3. Pulsations of fœtal heart. 4. *Brutt placentaire* (?) 5. Pulsation of umbilical cord (?)

**LABOR, SIGNS OF:** *Preliminary*—1. Neck of uterus obliterated, feeling like a "ring;" large enough to admit the index in multiparæ. 2. For two or three days an "uneasy" or slightly contracting uterus. 3. Sinking forwards

of fundus, with proportionate accessibility of finger to os; (b) frequent desire to urinate; (c) discharge of vaginal mucus. 4. Hæmorrhoids—increasing œdema of legs—pains in hips and loins. 5. Morbid action of mind.

*Essential.*—True intermitting labor pains, beginning at fundus. 2. Dilatation—longer to open to size of a half-dollar than to complete the process; rigors and emesis common. 3. Muco-sanguineous discharge. 4. Formation and rupture of “bag of waters.” Tremblings and loss of consciousness frequent at completion of dilatation.

POSITION AND PRESENTATION: if fetal pulsation heard *below* a line dividing the uterus mid-way horizontally, *vertex*. If *above* that line, *breech*. If *below*, and to the *left*, *first position*. If *below* and to the *right*, *second position*. If *below* 134 pulsations per minute, probably *male*; if *above*, probably *female*.

*Presumptive proof of first position:* 1. Heart beats plainest on *left* side (see above.) 2. Motion having been felt most on *right* side, as the “fourth position” rarely occurs. 3. Anterior fontanelle, having its long prong frontally, being up and back, as regards the vagina, and generally being out of reach of finger. 4. Widest, and most dependent part of tumor in *front*, the slope being backwards and upwards; (if third position, the posterior part of tumor is lowest and widest in the vagina).

*Rigid Os:* unguentum belladonnæ to os; warm water injections; æther or chloroform to “lulling” effect; dilators, ipecacuanha or antimonii et potassii tartaras *ad nauseam*.

*PAINS:* increase by ergota; opium; chloral. The two latter if deficiency dependent upon nervous excitement. *Never* give ergot unless you can complete delivery at any moment. Assurance from attendant goes a great ways; electricity; frictions over abdomen; compression of uterus; *introduction of elastic catheter between uterus and ovum*; warm water injection; plugging vagina; *rupturing of membranes*, if they be ready to rupture.

DURING stage of expulsion, do not allow patient "to go to stool"; use a bed-pan.

ALLOW walking only when head is in brim of pelvis, and not after the os is dilated and the membranes ready to rupture.

PLACENTA PREVIA: hæmorrhage generally begins at sixth month with cervix undilated and swelling of vaginal region of womb. In these earlier stages, rest, cooling drinks, and lastly the tampon are needed. At labor, hæmorrhage is during, not between, the pains; rest, cool room, cooling drinks and astringents; ice; opium and lead to alay contractions; astringent and iced injections; tampon; rupture membranes (Simpson), and if this fails and os undilated and below seventh month, separate placenta and extract; should os be readily dilated, turn and extract child, after separating a single placental cotyledon. Be chary of *accouchement forcé*. Simpson says: "separation of placenta is safe compared with turning." Ergota, hypodermically, if indicated.

FOOT EXTRACTION: being seated close to edge of bed, with patient's feet supported by chairs, oil back of hand, introduce (a part or the whole) into the vagina and grasp both feet (if both presenting), making traction; when born, the legs (the toes generally pointing backwards) are to be grasped higher up, the stronger, if not the entire, traction to be upon the one nearest the pubes, hereby assisting materially the proper rotation of the child for the head delivery; guard against "a riding (being astraddle) of the cord" in this stage; if delay in delivery of head, reintroduce the hand, insert finger into the child's mouth and flex the chin upon the chest, then use traction aided by abdominal pressure, remembering the head, as soon as liberated from the brim, rotates backwards (face to sacrum); to prevent perineal laceration, carry body gradually upwards over the pubes as it is "born"; the hip lying next to the pubes, and the same shoulder and portion of the head, is generally to be first liberated.

**TURNING** : chloroform, opium, antimony, or venesection, as preparatory ; lateral, or elbow-knee position of patient best ; oil all but the *inside* of hand ; choose the hand that will best grasp the back of the heels, which most generally corresponds to the opposite side of woman's pelvis in which the feet are ; introduce it between the abdominal surface of child and uterus, membranes (if unruptured, intervening ; one knee, the opposite to the presenting arm or shoulder, which is the upper knee, is grasped, and with traction and abdominal manipulation is brought down, the membranes generally rupturing. (Not necessary, generally, to bring down both knees or feet, and by choosing the opposite one to the presenting arm you get a rotation that more readily withdraws the arm into the uterus.) Traction can now be used to hasten delivery, if need be, all being the same as in *ordinary* foot or knee extraction.

**FIG.** As the knee is easier reached, makes less pressure upon the uterine wall during the rotation, it is preferable to grasping the foot. To discriminate from elbow, remember the *convexity of the knee points towards the face*. Introduce hand into *vagina* during pains, into *uterus* during intervals, *turn during intervals only*. Unnecessary to bring down *both knees or feet*, save in rare instances.

**HÆMORRHAGE during labor** : prognosis for child is bad, and for mother also, especially if placenta is detached ; in this latter case *deliver immediately*, by incising os, or dilating, or both (if the case be not placenta previa) ; ergota, hypodermically or internally ; frictions to uterus, and kneading through abdomen ; cold abdominal *douche* or slapping with cold wet towels. 2. If ovum not separated, then tampon might be applied till uterus is dilated, giving ergota and keeping up abdominal compression and frictions to keep uterus contracted ; quiet necessary in both cases.

**Post partum** ; head low, in horizontal position ; also quite quiet ; cool air ; acidulated drinks ; ergota hypodermically or *per os* ; grasp the uterus through the abdominal wall and compress it ; introduce the left hand

into the uterus and then compress it against the right femur without; compress uterus against the sacrum, ilium or pubes; compress abdominal aorta; ice-water *douche* to abdomen; clasp towels wrung from ice-water upon abdomen; electricity, continuous current; transfusion; ice placed to the os through the vagina; *never tampon*.

**COLLAPSE, or SYNCOPE**, from hæmorrhage: quiet; head low; stimulants guardedly, as brandy, egg-nog, milk-punch, strong coffee with opil tr.; compression of arteries of extremities in order to throw the blood more into the heart, brain and lungs.

**PUERPERAL CONVULSIONS**: venesection; chloroform; chloral potassic bromide; purgatives; veratrum viride; morphine sulphas; hot pack; hasten delivery; prevent patient from injuring tongue and lips by inserting cork, or piece of soft wood, between the teeth.

**FORCEPS**: *in lower strait*, to be applied to sides of the child's head. 1. If rotation has not occurred, rotate. 2. If occiput to pubes, traction to be downwards, outwards, upwards over pubes. 3. If face to pubes, traction downwards, outwards, and finely upwards over pubes.

*In superior strait*: to be applied with reference to the mother, *i. e.*, to the sides of the pelvis. 1. Rotate the head to its nearest position. 2. Flex chin upon the breast. 3. Then traction, rotation and extension in conformity to the natural motions of the passage of a child. The female blade should be introduced first. The introduction should be *between* pains, desisting as soon as they come on.

**INVERSIO UTERI**: replace at once, which is then easily done; if placenta slightly separated, do not detach till reposition is achieved; retain hand in uterus till it has contracted quite firmly, to prevent recurrence; ergota, cold *douche*, and electricity to favor contraction; keep strict dorsal decubitus and abdomino-muscular rest for several days.

**LACERATED PERINÆUM**: *avoid*, so far as possible, by I. Having patient assume the "anatomical" position-



II. By supporting the perinæum and so direct the head up over the pubes. III. By inserting finger in anus and drawing this and the perinæum forward. IV. Holding head back during a strong pain, and then, in the interval succeeding, gradually push the rima vulvæ back over the head. *Surgically treat* by *serre-fines* or introducing the requisite number of silver sutures to secure intimate coaptation of the parts at once, unless health or accidental circumstances necessitate the delay. The knees of the patient should be bound together, and the thighs kept coapted during healing.

*Vagina*: hæmorrhage rarely severe; pieces of ice, or mild styptics, generally suffice; a tampon may be applied for a short time.

*Vulva*: frequent, but not generally severe; if into the "bulb," hæmorrhage often alarming; a stream of cold water, or ice, or cotton dipped in ferri subsulphatis liquor, should be applied to the vessels; coaptation of the thighs and quiet necessary. Be careful of rectal action in all these cases.

ALWAYS empty the bladder and rectum before any obstetric "operation."

DILATATION of  $\frac{3}{4}$  inches for extraction of placenta,  $2\frac{1}{2}$  inches for introduction of hand, required.

### Eruption of Teeth.

*Deciduous*, 20 in number: central incisors.....7th mo.; lateral incisors...7—10th mo.; ant. molars.....12—14th mo.; canine.....14—20th mo.; post. molars....18—36th mo.;

*Permanent*, 32 in number: first molars.....6½ years; two mid. incisors, 7th year; two lat. incisors.....8th year; first bicusps...9—10th year; sec. bicusps...10—11th year; canine.....11—12th year; sec. molars.....12—14th year; wisdom.....17th—21st year; Those of the lower jaw generally precede those of the upper by one or two months.

## Visceral Measurements, etc. THE HEART.

**REGIONAL ANATOMY:** extends transversely from one-half inch to right of sternum to within one-half inch of left nipple; vertically from, and including, the second to the fifth intercostal space, the auricles being on a line with the third costal cartilages, and extending a little above and below them.

**MEASUREMENTS:** longitudinally, 5 inches; transversely, from median line to the left, on third rib,  $2\frac{1}{2}$  to 3 inches; on fourth rib,  $3\frac{1}{2}$  to 4 inches; on fifth rib, 3 to  $3\frac{1}{2}$  inches. Extends  $\frac{1}{2}$  inch to right of dextral border of sternum.

**VALVES:** *aortic*, behind sternum, near left edge, and in line of third intercostal space; *mitral*, behind left fourth costal cartilage near sternum; *pulmonary*, behind left third costo-sternal articulation; *tricuspid*, behind center of sternum on line of fourth costo-sternal articulation.

**AREA PERCUSSIONAL DULLNESS:** *superficial*, triangular, apex below left third costo-sternal articulation, the base on line with sixth costal cartilage; does not exceed 2 in. in any direction. *Deep*, (brought out by strong percussion) corresponds to cardiac measurements, the central portion being the area of "superficial dullness."

**MURMURS:** *aortic*, whole length and (upper part) width sternum. Only murmur that is propagated into the carotids. If "obstructive," is heard with first sound of heart, maximum intensity being heard at second dextral sterno-costal articulation. If "regurgitant," is diastolic maximum intensity at the same place as the "obstructive." *Mitral*, "obstructive" blubbery murmur just before the first heart-sound, maximum intensity being near apex beat; is larger than any other murmur; never heard at the back. "Regurgitant" takes the place of, or follows, first heart-sound, greatest intensity being at apex beat; nearly

as intense between 5th and 8th vertebræ at the back. *Pulmonic*, are rare and are limited to a small circular area about the region of the valves. *Tricuspid*, "regurgitant" heard in a triangular area extending (and partially including) from the second to the fifth intercostal space, left side though rarely heard above third rib; the base corresponds to line drawn from fifth left to fourth right intercostal space. Point of greatest intensity, near xiphoid cartilage, left side. Is a blowing murmur heard with, or taking the place of, the first heart-sound. Jugular pulsation pathognomonic when it can be detected.

#### THE KIDNEY.

**AREA OF PERCUSSIONAL DULLNESS:** patient should lie on the face; the long diameter extends from the eleventh rib to the crest of the ilium, and measures 4 inches; the transverse diameter measures 2 inches.

#### THE LIVER.

**AREA OF PERCUSSIONAL DULLNESS:** extends from lateral surface of eighth right rib obliquely upwards across the chest to 2 inches beyond median line on level with the fifth intercostal space, measuring some 12 inches; superiorly it is limited by the fifth rib, inferiorly by the free borders of the lower ribs. At the right of the median line, in front, the transverse diameter of this area measures 3 inches; on a line with the right nipple, 4; on the side,  $4\frac{1}{2}$ , on the back, 4.

#### THE SPLEEN.

Have patient lie on right side, when the superior border will be found to be limited by the ninth rib; the inferior, by free borders of the "floating" ribs; this gives the long diameter and measures between 4 and 5 inches. The short diameter varies from 3 to 4 inches.

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#### Exanthematica.

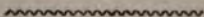
**VARICELLA:** incubation, 12 days. *Eruption*, third day of disease: appears first on face, then on neck and trunk; feels

like grains of sand beneath the skin, and does not disappear on pressure or stretching the skin; it is distinctly papular, fever remitting as soon as out. *Scabs* form on ninth day and fall off 5 or 6 days afterward. *Temperature*, 104° to 106°. *Danger*, septicæmia, pyæmia, and secondary (suppurative) fever.

**SCARLATINA:** *incubation*, 2 to 6 days. *Efflorescences*, on second day of fever; shows first on neck and chest; brightest on parts covered; declines, after 3 days; disappears on pressure or extension of the skin. *Temperature*, 104° to 106°. *Danger*, nephritis or pulmonary œdema. "Strawberry" tongue, and throat complications.

**RUBEOLA:** *incubation*, 10 to 14 days. *Eruption*, third or fourth day of fever; showing first on forehead; is patchy and brightest on parts exposed; fever does not abate on its appearance; declines in three or four days, and disappears on pressure or extension of the skin. *Temperature*, 101° to 102°. *Danger*, pneumonia and capillary bronchitis; Catarrhal (coryza) complications.

**VARICELLA:** *incubation*, 3 to 4 days. *Eruption*, second or third day, resembling water-blisters; first appears on breast and shoulders, and does not implicate the lower extremities; disappears on pressure, and totally in 5 days. *Danger*, none, and rarely any constitutional disturbance.



### Pronunciation of Medico-Biographical Names.

[These can, at most, be but approximate, as it is impossible to render into English the sounds of the German *umlauted* letters, or their equivalents; the French *nasal* sounds; the German *tsayhah*, etc. Where â, é or ô occurs the *long* sound, of the letter so marked, is to be given.

Abercromby (ab'er-krum"-by)	Aetius (a-e'shi-us)
Abernethy (ab'er-nee"thy)	Alibert (ah'li-ber")
Abul-Kasim (ah'bool-kah"-sim)	Amussat (ah'moo-sah")
	Andral (ang'drah'l")
	Aran (ah'rang")

<b>Aretæus</b> (a'ree-tee'us)	<b>Bouchut</b> (boo'shoo')
<b>As'cle-pi''a-des</b>	<b>Bouillaud</b> (boo'i-lô')
<b>Auerbach</b> (ower'bach)	<b>Boulard</b> (boo'lahr')
<b>Avenzoar</b> (av'en-zô'ar)	<b>Bouvier</b> (boo'vi-â')
<b>Avicenna</b> (av'esen'na)	<b>Boyer</b> (bwah'yâ')
<b>Bacchetti</b> (bah-kee'tee)	<b>Braun</b> (brown)
<b>Baillie</b> (bâ'lee)	<b>Braunschweig</b> (brown'-shwyg)
<b>Bärensprung</b> (bâr'en-sprung)	<b>Brechet</b> (bre'shay')
<b>Basedow</b> (bah'zee-dow)	<b>Briand</b> (bree'ang')
<b>Basset</b> (bah'say')	<b>Brown-Séguard</b> (-say'kahr')
<b>Bäumler</b> (boim'ler)	<b>Brücke</b> (bree'keh)
<b>Baudelocque</b> (bô'de-lock')	<b>Caillants</b> (kah'lang')
<b>Baudot</b> (bô'dô')	<b>Caillault</b> (kah'lô')
<b>Bauer</b> (bow'er)	<b>Capuron</b> (kah'poo-rong')
<b>Baum</b> (bowm)	<b>Cassan</b> (kah'sang')
<b>Baumés</b> (bô'may')	<b>Cazeaux</b> (kah'zô')
<b>Bayle</b> (bail)	<b>Cazenave</b> (kah'zenahve')
<b>Bazin</b> (bah'zeng')	<b>Celsi</b> (chel'see)
<b>Beclard</b> (bay'klahr')	<b>Champonnière</b> (shong'-pong-i-â')
<b>Becquerel</b> (bek'eh-rel')	<b>Chassaignac</b> (shah'sen-yahk')
<b>Begin</b> (bâ'zheng')	<b>Chausit</b> (shô'see')
<b>Belloq</b> (bel'lock')	<b>Chaussier</b> (shô'se-â')
<b>Bernard</b> (ber'nar')	<b>Chiari</b> (kee-ah-ree')
<b>Bichat</b> (bô'shah')	<b>Chomel</b> (shô'may')
<b>Biermer</b> (beer'mer)	<b>Chopart</b> (shô'pah'r')
<b>Billroth</b> (beel'rote)	<b>Civiale</b> (sev'e-ahl')
<b>Bischoff</b> (bish'off)	<b>Cloquet</b> (klô'kâ')
<b>Blachet</b> (blah'shay')	<b>Cobbold</b> (cob'bolt)
<b>Blainville</b> (blang'veel')	<b>Coccius</b> (côk'si-us')
<b>Blandin</b> (blang'deng')	<b>Colombat</b> (co'long-bah')
<b>Blatin</b> (blah'teng')	<b>Combe</b> (koom)
<b>Böhmer</b> (bee'mer)	<b>Conheim</b> (kôn'heim)
<b>Boerhaave</b> (boor'hah'veh)	<b>Coste</b> (cost)
<b>Boinet</b> (bwah'nay')	<b>Coster</b> (cos'tâ')
<b>Boivin</b> (bwah'veng')	<b>Courtenay</b> (koort'nâ')
<b>Bonnafont</b> (bon'na-fong')	<b>Crichton</b> (kry'ton)
<b>Bonnet</b> (bon'nay')	
<b>Bouchardat</b> (boo'shar-dah')	

<b>Cruevillier</b> (kroo'väll-yâ'')	<b>Frankenhäuser</b> (-hoiser)
<b>Cullérier</b> (kul-lay'ri-â'')	<b>Friedreich</b> (freed'rych)
<b>Czermak</b> (tsher'mahk)	<b>Galenus</b> (ga-lee'nus)
<b>De Boismont</b> (de bwah-mong')	<b>Gallard</b> (gal'lar')
<b>Décès</b> (day-say'')	<b>Garin</b> (gar'eng')
<b>De Jongh</b> (de'zong')	<b>Geigel</b> (guy-gel)
<b>De Lafaye</b> (de'lah-fay')	<b>Geissler</b> (gys'ler)
<b>De la Motte</b> (de'la-mot')	<b>Gendrin</b> (zhen'dreng)
<b>Delpech</b> (del'paysh')	<b>Gibert</b> (zhee'ber')
<b>Deneux</b> (day'new')	<b>Gioppi</b> (jop'pee)
<b>Denham</b> (den'am)	<b>Giraud-Teulon</b> (zhe'rô-to-long')
<b>Depaul</b> (day'pôl')	<b>Girault</b> (zhe'rô')
<b>Deroubaix</b> (day'roo bay')	<b>Goffin</b> (gof'feng')
<b>Desault</b> (day'zô')	<b>Goffres</b> (gof'fray')
<b>Desmarres</b> (day'mahr')	<b>Graefe</b> (grâf'feh)
<b>Devergie</b> (day'ver-zhy')	<b>Grünhagen</b> (green'hah'gen)
<b>Deville</b> (day'vil')	<b>Guido</b> (gwee'dô)
<b>Dieffenbach</b> (deef'en-ba'k)	<b>Guilbert</b> (gil'ber')
<b>Dieulafoy</b> (d'ew'la-fô'ah)	<b>Guéniot</b> (gay'ni-ô')
<b>Donne</b> (dong)	<b>Guenzburg</b> (geens'burg)
<b>Dubois-Raymond</b> (doo'bo-ah-ray'mong)	<b>Guerin</b> (gay'reng')
<b>Duchek</b> (dew-shek)	<b>Guersant</b> (gâr'sang')
<b>Duchenne</b> (doo'sheng')	<b>Guyon</b> (gy'ong')
<b>Duges</b> (doo'zhay')	<b>Haenisch</b> (hân-ish)
<b>Duparcque</b> (doo'park')	<b>Hennig</b> (hay'nig)
<b>Dupuytren</b> (doo'pwe-treng')	<b>Hervieux</b> (her'view')
<b>Dusch</b> (doosh)	<b>Heubner</b> (hoib-ner)
<b>Ebermaier</b> (â'ber-my'er)	<b>Heurteloup</b> (hewr'te-loo')
<b>Eulenburg</b> (oi'len-burg)	<b>Heuter</b> (hoi'ter)
<b>Eustachio</b> (use-tay'chee-o)	<b>Hey</b> (hay)
<b>Fallin</b> (fal'leng)	<b>Hillier</b> (hil'i-â')
<b>Fau</b> (foe)	<b>Hip-poc'ra-tes</b>
<b>Flourens</b> (floo'reng')	<b>Huguier</b> (hoo'goo'-i-â')
<b>Fordyce</b> (for'dice)	<b>Hyrtl</b> (hir'tle)
<b>Forget</b> (for'zhay')	<b>Iwanoff</b> (â'van-off)
<b>Förster</b> (fer'ster)	<b>Jaccoud</b> (zhah'coo')
<b>Fournié</b> (foor'ni-â)	<b>Jaeger</b> (yâ'ger)
	<b>Javal</b> (yah'val')

Jobert (zhō'ber')	Malgaigne (mahl'-gain''ye)
Joulin (zhoo'leəg')	Malpighi (mal-pee'gee)
Juergensen (yōur-gen-sen)	Marotte (mah'rote')
Kiwisch (kee'weesh)	Masse (mahs)
Klob (klop)	Mauriceau (mō're-sō)
Kölliker (kel''le-ker')	Mayer (mier)
Köster (kes'ter)	Mayor (may'ōh')
Kühne (kee'ne)	Meckle (may'k'l)
Kussmaul (koos'maul)	Meigs (meggs)
Laaser (lah'ah'say')	Meissner (mice'ner)
Laborderie (lah'bor-der'i-ā')	Meric (may'ree)
Lacroix (lah'crō''ah)	Mikschik (meek'sheek)
Lancereaux (lang'see-rō')	Mondino (mon-dee'no)
Lallemand (lal'mong')	Montault (mong'tō')
Langenbeck (lahng''en-bāk')	Moreau (mō'rō')
Larcher (lar'shay')	Morgaigne (mō'gain''ye)
Larrey (lar'ray')	Möser (me'ser)
Lebert (lay'ber')	Mourongval (moo'rong- va'l')
Lebrun (lay-brung')	Müller (meel'er)
Lefauchaux (lay'faw-shoo')	Naboth (nah'bōt)
Legouest (lay'gou-ā')	Naegele (nā'ge-le)
Leichenstern (like-en-stern)	Naunyn (now-neen')
Lenoir (leng'wahr')	Negrier (nay'gri-ā')
Lesouef (lay's'way')	Nélaton (nay'lah-tong')
Leube (loi-be)	Neudörfer (noi'deer''fer)
Leuckhart (loik'hart)	Neugebauer (noi'ge-bow'er)
Leudet (loi'det)	Niemeyer (nee'my'er)
Levrat (lay'vrah')	Nivet (nee'vay')
Liebermeister (lee-ber-mys- ter)	Nonat (no'nah')
Liebreich (lee'brych)	Nothnagel (note-nah'gel)
Lisfranc (lee'frang')	Obernier (ō-bairn-yā')
Litré (lit'tray')	Oertel (er-tel)
Longet (long'shay')	Ollenroth (ol'ten'rote)
Louis (loo'ee')	Ollivier (ol-lev'i-ā')
Lücke (lee'keh)	Oppolzer (op-pol'tser)
Luschka (lush'ka)	Par-a-cel'sus
Macleod (mc'cloud')	Paré (pah'ray')
Malabar (mah'ōrr')	Paris (pah'ree')

Passavant (pah'sah-vang')	Sanson (sang'song')
Perrin (per'reng')	Scanzoni (skan'tso''ne)h
Petit (p'tee)	Schauenburg (shau''en- berg')
Pétrequin (pay'tre-keen')	Scheffler (shef'fler)
Pilz (pilts)	Schlegel (shlay'gel)
Plouget (ploozhay')	Schmidt (shmi')
Palli (pal'lee)	Schönlein (shen'lyn)
Pouchet (poo'shay')	Schröder (shre'der)
Poupart (poo'par')	Schröter (shret-er)
Puech (peesch)	Schuh (shoo)
Ranvier (rang'vi-â')	Schultze (shool'tse)
Rayer (rah'yâ')	Scultet (skool'tay')
Raulin (rô'leng')	Scul-tê'tus
Raynaud (ray-no')	Sédillot (say'dil-lô)
Recamier (ray'cam-i-â')	Seltz (sights)
Reliquet (rel'i-kâ')	Seutin (soi'teen)
Remak (ray'makk)	Sichel (sich'h'el)
Richard (ree'shar')	Siebold (see'bolt)
Richerand (ree'sher-ann')	Simon (see'mong')
Richeit (ree'shet')	Sömmering (se'mâ'ring)
Ricord (ree'cor')	Sous (soo)
Riecke (reek'eh)	Stellwag (stâl'vwak'h)
Riegel (rê-gel)	Steudener (stoi'den-er)
Rindfleisch (rinnd-flysh)	Stillé (steel'lay')
Robert (ro'ber')	Struwe (stroo'feh)
Robin (ro'beng')	Sydenham (sid'en-'am')
Rochard (ro'shar')	Tanchon (tang'shong')
Roche (rôsh)	Tansini (tan'see'nee)
Rodier (ro'di-â')	Tarnier (tar'ni-â')
Rollet (rol'lay')	Téallier (tail'i-â')
Rosenthal (ro'sen-tal')	Tessier (tes'si-â')
Rouget (roozhay')	Theden (tay'den)
Roux (roo)	Thelle (tyl'leh)
Rüdinger (ree'ding'er)	Thiersch (teersh)
Rühle (rê-le)	Thierfelder (teer-fel-der)
Ruysch (roish)	Tobold (to'bolt)
Sabatier (sah'bah-ti-â')	Traube (trow'be)
Sacchi (sahk'kee)	Trélat (tray'lah')
Saemish (say'meesh)	



the heart, with a constant tendency to syncope, or with a debilitated and deranged state of brain. *Cold diet* for 24 hours after administration, to prevent sickness; iced milk the best. A teaspoonful of brandy just before administration, will be found beneficial.

*Local*: Carbolic acid, 1 part to 20 of water, paint the part to be incised for 20 minutes, then apply the pure acid, it will not then destroy the skin. Incise immediately. Also ether spray or "freezing mixtures" may be used.

ANTISEPTICS FOR WOUNDS: salicylic or carbolic acid; comp. tr. benzoini; as *stimulant*, balsamum Peruvianum.

APNŒA: from *drowning, hanging, anæsthetics*, etc., see pages 62, 63.

*From foreign bodies in air passages*: if round and smooth, invert the patient and strike on the back; laryngotomy; tracheotomy.

*Of the new-born*: clean mucus out of nostrils and throat; catheterize the trachea, and suck up the mucus. "Marshall Hall's method," by placing child on abdomen, then bringing into lateral posture (see page 62), repeating slowly and deliberately. "Schulze's method," by placing the thumbs upon the ant. surface of thorax, the indices in the axillæ, and the other fingers along the back, the face of the child being from you; rotate the child, by swinging upwards, so that the inferior extremities turn over towards you. In a moment re-rotate to the original position. Do not support head or legs in the forward rotation; their bending upon or towards the abdomen gives a forced expiration.

APOPLEXY: palliative, as horizontal position, with head raised, cool air, quiet, constriction of clothing removed; if stomach *full*, a non-depressing emetic; 2 or 3 drops of ol. tiglii on the tongue, unless there is *anæmia*, is good practice; cold to the head in all stages. If from "shock," stimulating enemata and baths. "Bleeding" is uncalled for save in unquestionable cases of congestion; where coma is profound, showing considerable hæmorrhage, do not "bleed." Artificial respiration of use.

**BANDAGE, PLASTER:** *delay* hardening by the addition of little size or stale beer to the mixture. *Accelerate* the hardening by the use of warm water and salt.

**BURNS:** carbolic acid lotion;  $\mathcal{R}$ . *acidi tannici* ʒj; *chloroformi* gtt. xx; *cerati simplicis* ʒj. M. Spread upon lint and cover the parts affected; or,  $\mathcal{R}$ . *liquoris calcis et olei olivæ ana partes æquales*, applying upon lint or linen; poultice.

**CONVULSIONS—*epileptic*:** unloosen patient's clothes; horizontal posture; fresh air; only a partial confinement of motions; cold water sprinkled in face; these will generally be sufficient.

2. *Uræmic*: hot air or vapor bath; active hydragogue cathartics; dry cupping; hot applications to loins; chloroform; venesection (rarely).

3. *In children*: fresh air; loosen clothing; sprinkling cold water on face and chest; place feet in hot water to which mustard has been added; a general hot bath from 5 to 15 minutes; chloroform, withholding it as soon as spasmodic movements cease; emetics and cathartics if from stomachic or intestinal irritation; lance the gums if from teething; chloral and bromides internally.

4. *Hysterical*: diagnose from other convulsions by sensibility being incomplete; pupils undilated and responsive to light; pulse normal; no biting of tongue; no lividity of face. Treat by loosening clothes thoroughly; dash *cold* water on face and breast; close mouth and nostrils firmly for a moment so the patient cannot breathe; *assafœdita*, *valeriana* or *lq. am. acetatis* may be given.


**NOTE.**—In all cases of *true* convulsions place a cork, or piece of soft wood, or roll of cotton between the teeth of the patient, to prevent wounding of the tongue, lips or cheeks. It has been considered advantageous to place the patient upon the *left* side when convulsed.

**EPISTAXIS:** keep head elevated and cool; make the feet and hands warm by plunging them into hot water; apply ice-water over the nose; if alarming, resort at once to the tampon; insufflations rarely beneficial.

**FRACTURES:** *simple into joints* should be put up with limb at most convenient angle, as ankylosis generally ensues. *Compound* into joints require exsection, if in the upper extremities, amputation if in the lower; that is if they be important joints. *Impacted* should not have their fragments separated, hence be chary of manipulation. *Simple, with lacerated arterial trunk*, cut down and ligate *above*, not on, the seat of injury.

*Measuring the superior extremity for fracture:* I. extremity of acromian process to external condyle of humerus. (b). From tip of coracoid process to the inner condyle of humerus. II. From condyles of humerus to the styloid process of the ulna and radius. *Lower extremity:* Ant. sup. spinous process ilium to inferior border patella, pushing the latter up as far as the ligament will allow (b). Crest of ilium to top of trochanter major. (b). Patella (inf. border) to either of the malleoli. (c). Ant. sup. spinous process ilium to either malleoli. If a line be drawn from the anterior superior iliac spine to tuberosity ischii, a normally placed trochanter major will just touch this line. (Nélaton's test line.)

In warm-water treatment coat the member with oil so as to prevent too great swelling. Also clean off the pus, as it is apt to coagulate and so prevent a free discharge.

 Always tendency of integument about a fracture to slough, hence see that your splints are *well* padded, and do not press upon the seat of injury.

**FROSTBITE:** keep all warmth away till natural warmth comes back; frictions with snow or ice-water; cold enemata of spirits or ammonia; dry frictions.

**HÆMOPTYSIS:** salt; gallic acid; plumbic acetate, or other astringents; inhalation of astringents from the atomizer; nux vomica; ergota; plumbic acetate.

**HÆMORRHAGE.** 1. *From teeth extraction:* empty the sockets of all coagulum and plug with cotton, moistened with subsulphate of iron, over this apply a pad of dry cotton cloth and close the jaws firmly.

2. *Arterial*: torsion; ligature; lq. ferri subsulphatis; actual cautery; compression; ice; *hot water*. The last at 100° to 115° applied continuously for 10 or 15 minutes, especially applicable for uterine, or pelvic congestions.

**HEAT**: prolonged at 134° F. destroys tape-worm; at 160°, trichinæ.

**INSOLATION** (sunstroke): (*no hemiplegia*); absolute rest and quiet; free air; loose clothes; cold to head, chest and neck, as ice, *douche*, and sponging; potassic bromide in cold water enemata; stimulants in frequent and feeble pulse; venesection only when *full* pulse, livid face, stertorous breathing, throbbing carotids; same as to use of ol. tigii; chloroform, if convulsious; sinapisms.

**LIGHTNING**: recumbent posture; loosen clothing; stimulants, as ammonia, brandy, etc., by mouth or rectum; for "burns", see page 94; tonics and galvanism as "after-treatment."

**OZONE**:  $\mathcal{R}$ . Potassii permanganatis, 3j; Acidi oxalici, 3j, moistened with twice the amount of water (by bulk), will omit ozone freely enough to ozonize a large room. The powder should be again moistened in two hours by a small amount of water.

**PHLEBOTOMY**: select the cephalic or median-cephalic vein.

**SEA SICKNESS**: Amyl nitrite, have 8 drops inhaled from handkerchief. Potossii bromide internally.

**SPECTACLES**: use cobalt *blue* and *not* the green-glass spectacles, for cases of photophobia, or where strong light may prove injurious to the retina.

**SYNCOPE**: loosen clothes; fresh air; place patient in the horizontal posture with head *low*; sprinkle cold water over the face, and apply volatile substances to the nose; stimulants internally; artificial respiration; galvanizing pneumogastric.

**TEMPERATURE**: average normal, of adults, 98.4° F. There is a diurnal variation of 1.5°, being highest in the evening. Exercise, climate, food and drink modify slightly, but a variation of 1.5° predicates disease. A rapid

rise or fall is indicative of danger; a gradual decline, of convalescence.  $106^{\circ}$  may be considered the general limit at which adult patients may recover. In a child the normal temperature is about  $1^{\circ}$  higher than in an adult, and in commensurate febrile disturbance a proportionate increase of temperature is noticed. The axilla, mouth, rectum and vagina are the points usually selected for taking the temperature, the thermometer being retained *in situ* some 5 minutes. A rise of  $1^{\circ}$ , when above  $100^{\circ}$ , is considered equivalent to an increase of 10 beats of the heart.

**TRACHEOTOMY:** (*Laryngotomy* cannot be performed on the young; it is the opening of the crico-thyroid membrane. In adults it is generally preferable to T.) Make incision 2 inches long, in median line, through the superficial structures above the trachea, previously selecting a point  $\frac{1}{2}$  inch below cricoid cartilage for opening the tube; if arterial hæmorrhage, control by ligation or torsion before opening the trachea; if venous, need not mind it. Divide three or four tracheal rings, holding the cut edges asunder by tenacula, wire, silk, or catheter, till trachea-tube be at hand, having previously rolled the patient up on the side to favor the escape of blood, mucus, etc.

### Weights, Measures, etc.

#### APOTHECARIES' WEIGHT.

20 grains ( <i>gr.</i> )	make one	scruple— $\mathfrak{s}$
8 scruples	" "	drachm— $\mathfrak{d}$ —gr. 60
8 drachms	" "	ounce— $\mathfrak{z}$ —gr. 480
12 ounces	" "	pound— $\mathfrak{lb}$ —gr. 5,760

#### APOTHECARIES' MEASURE.

60 minims ( $\mathfrak{m}$ )	make one	fluid-drachm— $\mathfrak{f}$ $\mathfrak{z}$
8 fluid-drachms	make one	fluid-ounce— $\mathfrak{f}$ $\mathfrak{z}$
16 fluid-ounces	" "	pint— $\mathfrak{o}$
8 pints	" "	gallon— $\mathfrak{c}$

#### Dist.

<i>water.</i>	<i>Gr.</i>	<i>Oud. in.</i>	$\mathfrak{m}$	<i>French.</i>
$\mathfrak{z}$ 1=	56.96=	.2=	60=	3.697 millilitres
$\mathfrak{z}$ 1=	455.72=	1.8=	480=	2.957 centilitres
$\mathfrak{o}$ 1=	7,291.66=	28.8=	7,680=	4.732 decilitres
$\mathfrak{c}$ 1=	58,838.31=	231=	61,440=	3.785 litres

## WEIGHTS, MEASURES, ETC.

## A VOIRDUPOIS WEIGHT.

1=437.5 grains. 1l=7,000 grains.

## APPROXIMATE MEASURES.

One minim varies from one to two drops

1 fluid-drachm	equals (about)	1 teaspoonful
2 fluid-drachms	"	" 1 desertspoonful
$\frac{1}{2}$ fluid-ounce	"	" 1 tablespoonful
2 fluid-ounces	"	" 1 wineglass
4 fluid-ounces	"	" 1 teacup

## TABLE FOR APPORTIONING DOSES.

21 years of age,	full dose
14 "	$\frac{2}{3}$ "
12 "	$\frac{1}{2}$ "
6 "	$\frac{1}{3}$ "
1 year of age, 1-12th	"
3 mos. of age, 1-20th	"

1 LINE (")=1-12th of an English inch (").

## FRENCH WEIGHTS AND MEASURES.

## LENGTH.

1 metre	equals	39.368 inches
1 decimetre	"	3.9368 inches
1 centimetre	"	.39368 of an inch
1 millimetre	"	.039368 of an inch
1 decametre	"	393.68 inches
1 hectometre	"	3,936.8 inches
1 kilometre	"	39,368 inches
1 myriametre	"	393,680 inches

## WEIGHT.

1 gramme	equals	15.434 grains
1 decigramme	"	1.5434 grains
1 centigramme	"	.15434 of a grain
1 decagramme	"	154.340 grains
1 hectogramme	"	1,543.402 grains

## MEASURE.

1 litre	equals	2.113 pints or	15.434 grains
1 decilitre	"	3.841 f 3	" 1,543.4 grains
1 centilitre	"	2.705 f 3	" 154.34 grains
1 millilitre	"	16.231 m	" 15.434 grains
1 decalitre	"	2.641 C	" 154,340 grains
1 hectolitre	"	26.419 C	" 1,543,400 grains
1 kilolitre	"	264.19 C	
1 myrialitre	"	2,641.9 C	

## TEMPERATURE.

1° Fahrenheit=5-9° Centigrade=4-9° Reaumur. To reduce F. to C.: *subtract 32° from the F. degrees given, and divide the remainder by 1.8.* To reduce C. to F.: *multiply the C. degrees given by 1.8, and then add 32° to this product.*

# Abbreviations.

**R**, *recipe*, take.  
**aa**, *ana*, of each.  
**AD 2 D.**, *ad duas doses*, at two doses.  
**ADD**, *add*, add.  
**AD**, *ad*, up to.  
**AQ. DESTIL.**, *aqua destillata*, distilled water.  
**AQ. FERV.**, *aqua fervens*, hot water.  
**AQ. FLUV.**, *aqua fluvialis*, river water.  
**AQ. FONT.**, *aqua fontana*, spring water.  
**BULL.**, *bulliat*, boil it.  
**C.**, *congius*, gallon.  
**CAP.**, *capiat*, [let patient] take it.  
**CHART.**, *chartula*, a powder.  
**COCH. MAG.**, *cochleare magnum*, tablespoonful.  
**COCH. MED.**, *cochleare medium*, dessertspoonful.  
**COCH. PARV.**, *cochleare parvum*, teaspoonful.  
**COL.**, *cola*, strain or filter.  
**COLLYR.**, *collyrium*, eye-wash or eye-drops.  
**COMP.**, *compositum*, compounded or compound.  
**D.**, *dosis*, dose.  
**DECOCT.**, *decoctum*, decoction.  
**DIL.**, *dilue*, dilute; *dilutus*, diluted.  
**DRM.**, *dracma*, one-half.  
**DIV.**, *divide*, divide.  
**ELEC.**, *electuarium*, electuary.  
**ENEM.**, *enema*, enema.  
**FT.**, *fat*, make.  
**FT. H. (OR HAUST)**, *fat haustus*, let a draught be made.  
**GARG.**, *gargarisma*, gargle.  
**HAUST.**, *haustus*, a draught.  
**INF.**, *infunde*, pour in or into.  
**INFUS.**, *infusio*, infusion.  
**INJ.**, *iniciatur*, inject.  
**M.**, *misce*, mix.  
**MIST.**, *mistura*, mixture.  
**MIC. PAN.**, *micæ panis*, crumbs of bread.  
**NO.**, *numero*, in number.  
**O.**, *octarius*, a pint.  
**POCUL.**, *poculum*, a cup.  
**P. R. N.**, *pro re nata*, as symptoms demand.  
**PULV.**, *pulvis*, powder.  
**Q. P.**, *quantum placeat*, as much as you please.  
**Q. S.**, *quantum sufficiat*, a sufficient quantity.  
**REDIG. IN PULV.**, *redigatur in pulverem*, pulverise.  
**S. OR SIG.**, *signa*, write.  
**S. A.**, *secundum artem*, according to art.  
**SIGN.**, *signatio*, a label.  
**TRIT.**, *tritura*, triturate.  
**TROCH.**, *trochiscus*, lozenge.

# INDEX.

## INDEX.

	PAGE
Abbreviations, list of.....	99
Aquæ.....	83
Asphyxiated, rules for reviving the .....	62
Calendar, obstetric.....	75
Case-endings, genitive, in prescription writing.....	50
Cerata.....	84
Decocta.....	34
Doses, table for different ages.....	98
" of remedies.....	5
Drops, number in 20 minims.....	51
Elixirs.....	84
Emplastra.....	86
Exanthematica, table of.....	84
Fees, table of.....	90
Fœtal head, diameters of.....	76
Fœtus, average size of.....	77
Heart, measurements of.....	83
Incompatibles, list of.....	51
Infusa.....	36
Kidney, measurements of.....	84
Labor, signs of.....	77
Linimenta.....	37
Liquores.....	37
Liver, measurements of.....	84
Measurements, visceral.....	83
Measures, Weights, etc., Apothecaries'.....	97
" French.....	98
Obstetric Department.....	75
Pelves, measurements of.....	76
" smallest admitting passage of living child.....	76
" warranting embryotomy.....	76
Pronunciation, rules for.....	49
Pilulæ.....	38
Placenta previa.....	79
Poisons, antidotes for.....	57
" tests for.....	64
Position and Presentation.....	78
Pregnancy, evidences of.....	77
Pronunciation, rules for.....	49
" of medico-biographical names .....	85
Suppositoria.....	43
" Short stops".....	92
Teeth, eruption of.....	82
Tests for Urinary Deposits.....	68
Trochisci.....	44
Turning.....	80
Unguenta.....	45
Wounds, poison (from animals or dissecting).....	62



# Leonard's Uterometric Sound.



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1880.



## HEAD AND NECK.

### MUSCLES.

(Nervous supply is indicated by [ ] brackets.)

The — dash divides the origin from the insertion.

#### (1) EPICRANIAL REGION 1.

**Occip'ito-fronta'lis** : outer  $\frac{3}{4}$  superior curved line of occiput, and mastoid process—frontal quadrilateral expansion to the facial muscles. [Supra-orbital, facial, occipital, posterior auricular.]

#### (2) AURICULAR REGION 3.

**Attol'lens au'rem** : occipital fascia—upper part of pinna. [Small occipital.]

**Au'rihens au'rum** : lateral edge aponeuro'sis of occipito-frontalis—front of helix. [Facial, inferior maxillary.]

**Ret'rahens au'rem** : mastoid process—lower cranial surface of the concha. [Facial.]

#### (3) INTRA-AURICULAR REGION 4.

**Ten'sor tym'pani** : inferior surface petrous bone, Eustachian tube—backwards to handle malleus. [Otic ganglion.]

**Laxa'tor tym'pani ma'jor** : spinous process sph'enoid, Eustachian tube—back through Glaserian fissure to neck of the malleus, [Facial.]

**Laxa'tor tym'pani mi'nor** : superior and posterior part external meatus—forward and inwards to handle of the malleus. [Facial.]

**Stape'dius** : interior of pyramid—forward to neck of stapes. [Facial.]

#### (4) PALPEBRAL REGION (4) 3.

**Orbicula'ris palpebra'rum** : internal angular process frontal bone, nasal process superior maxilla, sphincter of eye. [Facial and supra-orbital.]

**Corru'ga'tor supercil'ii** : inner extremity superciliary ridge—under surface orbicularis, opposite the middle of the orbital arch. [Facial, supra-orbital.]

**Ten'sor tar'si** : crest of os lachrymalis—tarsal cartilage near puncta ; covers in lachrymal canals. [Facial.]

#### (5) ORBITAL REGION 7.

**Laxa'tor palpe'bre superio'ris** : inferior surface lesser wing of sphenoid, anteriorly to foramen opticum—upper border superior tarsal cartilage. [IIIId.]

**Re'ctus super'ior** : margin optic foramen—sclerotica. [IIIId.]

**Re'ctus infe'rior** : optic foramen—sclerotica. [IIIId.]

**Re'ctus inter'nus** : optic foramen—sclerotica. [IIIId.]

**Ge'nio-hyoid'e'us**: inferior genial tubercle inferior maxilla—body os hyoides. [Hypoglossal.]

(4) LINGUAL REGION (5) 4.

**Ge'nio-hy-glos'sus**: superior genial tubercle of inferior maxilla—os hyoides and whole length inferior surface tongue. [Hypoglossal.]

**Hy-glos'sus**: side of body and greater and lesser cornua hyoid—back and side of tongue. [Hypoglossal.]

**Lingua'is**: under surface glossa from base to tip, between hyo-glossus and Genio-hyo-glossus. [Chorda tympani.]

**Sty'lo-glo'sus**: outer and anterior center styloid process—side of tongue. [Hypoglossal.]

(5) PHARYNGEAL REGION (5) 4.

**Constric'tor infe'rior**: sides of cricoid and thyroid cartilages—fibrous raphe of posterior median line of pharynx. [Pharyngeal plexus, glosso-pharyngeal, external laryngeal.]

**Co-nstric'tor me'dius**: greater and lesser cornua hyoid—posterior median pharyngeal raphe. [Glosso-pharyngeal, pharyngeal plexus.]

**Con-strictor supe'rior**: lower 3d of the margin of internal pterygoid plate, palate and contiguous palatal muscles—posterior median pharyngeal raphe and occipital pharyngeal spine. [Glosso-pharyngeal, pharyngeal plexus.]

**Sty'lo-pa-rynge'us**: inner side base of styloid process—constrictor muscles and upper border thyroid cartilage. [Glosso-pharyngeal and pharyngeal plexus.]

(6) PALATAL REGION 5.

**Leva'tor pala'ti**: under surface petrous portion of temporal, Eustachian tube—posterior surface soft palate. [Facial.]

**Ten'sor pala'ti**: scaphoid fossa of the sphenoid, Eustachian tube (bound to hamular process)—anterior surface hard and soft palate. [Otic ganglion.]

**Arygos uvu'lae**: posterior nasal spine palate bone—uvula. [Facial.] (Is not a *single* muscle as its name implies.)

**Pa'la'to-glos'sus**: (anterior pillar) anterior lateral surface soft palate—side and dorsum of tongue. [Meckel's ganglion.]

**Pa'la'to-pharynge'us**: (posterior pillar) soft palate—joins stylo-pharyngeus to be inserted into posterior border thyroid cartilage. [Meckel's ganglion.]

(7) INTRA-LARYNGEAL REGION 5.

**Cri'co-thyroid'e'us**: front and side of cricoid—up- and outwards to lower border thyroid cartilage. [Laryngeal to the muscles *this group*.]

**Thy'ro-ary'tenoid'e'us**: posterior surface thyroid cartilages and



crico-thyroid membrane—backwards to anterior surface arytenoid cartilage; (false vocal cord.)

**Cri'co-aryte'no de'us latera'li:** superior border cricoid cartilage—obliquely up- and backwards to external angle base arytenoid cartilage.

**Cri'co-aryte'no de'us poste'rior:** posterior surface cricoid cartilage—up- and outwards to external angle base arytenoid.

**Aryte'noide'us:** fills up posterior concave surface of arytenoid cartilage.

#### (8) EPIGLOTTIDIAN REGION 3.

**Thy'ro-epig'lotide'us:** internal surface thyroid cartilage—upwards to margin of epiglottis. [Laryngeal to the muscles of this group.]

**Ary'eno-epig'lotte'us supe'rior:** apex arytenoid cartilage—to fold mucous membrane between arytenoid cartilage and side of epiglottis.

**Ary'eno-epig'lotte'us infe'rior:** arytenoid cartilage just above superior vocal cord—forwards and upwards to the margin of the epiglottis.

#### (9) ANTERIOR VERTEBRAL REGION 4.

**Rec'tus cap'itis anti'cus ma'ior:** (continuation scalenus anticus) slips from anterior tubercles transverse processes 3d, 4th, 5th and 6th cervical vertebræ—basilar process occipital bone. [Suboccipital and cervical plexus.]

**Rec'tus cap'itis ant.'us mi'or:** anterior surface lateral mass of atlas and its transverse process—basilar process occipital. [Suboccipital, cervical plexus.]

**Rec'tus latera'lis:** upper surface transverse process atlas—jugular process occipital. [Suboccipital.]

**Lev'us col'li:** *1st portion* from anterior tubercles transverse processes of 3d, 4th and 5th cervical vertebræ—tubercle of anterior arch of atlas; *2d portion* from 1st, 2d (and 3d) dorsal—transverse processes 5th and 6th cervical vertebræ; *3d portion* from 1st, 2d, 3d dorsal and 7th, 6th, 5th cervical—bodies 2d, 3d and 4th cervical vertebræ. [Lower cervical branches.]

#### (10) LATERAL VERTEBRAL REGION. 3.

**Scale'nus anti'cus:** inner border and superior surface 1st rib—anterior tubercles transverse processes 3d, 4th, 5th and 6th cervical vertebræ. [Branches lower cervical.]

**Scale'nus me'dius:** behind groove for subclavian artery on 1st rib—posterior tubercles transverse processes lower 6 cervical vertebræ. [Branches lower cervical.]

**Scale'nus post'icus:** 2d rib, outer surface—transverse processes lower 3 cervical vertebræ. [Branches lower cervical.]

## (11) POSTERIOR VERTEBRAL REGION 4.

**Ecc'tus cap'itis post'cus ma'ior**: spinous process axis—inferior occipital curved line. [Occipital.]

**Ecc'tus cap'itis post'cus mi'ior**: tubercle posterior arch atlas—beneath insertion of above. [Occipital.]

**Obliq'us infe'rior**: spinous process axis—horizontally to transverse process atlas. [Occipital.]

**Obliq'us supe'ri r**: transverse process atlas—occipital bone, between curved lines. [Occipital.]

## ARTERIES.

**CAROTIS COMMUNIS**: arises on right side, from innominate, behind sterno-clavicular articulation; on left side, from arch of aorta, highest part, and is more deeply placed than the right and passes obliquely outwards to root of neck behind sterno-hyoid and sterno-thyroid muscles, innominate vein and thymus gland. Starting now from each side of neck, each pass up- and outwards to superior border of thyroid cartilage, there dividing into external and internal carotid. Course indicated by line from sternal end clavicle to point midway between mastoid process and angle of inferior maxilla. Vein lies to outside, pneumogastric nerve on posterior plane between them, the three being enveloped by same sheath of cervical fascia. No branches but terminal.

**CAROTIS EXTERNA**: (8 brs., see above) up between neck of inferior maxilla and external meatus, there dividing into temporal and internal maxillary. Crossed by hypoglossal nerve, lingual and facial veins, digastric and stylo-hyoid muscles. Is quite superficial. **Thyroide'a supe'rior**: greater cornu hyoid, curving down to thyroid gland *anas.* with its fellow of opposite side and inferior thyroid. **Hyoid'e'a**, runs along inferior border of bone, *anas.* with opposite fellow. **Descen'dens superficialis**, down- and outwards across sheath common carotid supplying sterno-mastoid and adjacent muscles and integument. **Larynge'a supe'rior** pierces thyro-hyoid membrane supplying muscles, mucous membrane glands, etc., of larynx and epiglottis; *anas.* with opposite fellow. **Cri'co-thyroide'a**, transversely across crico-thyroid membrane, *anas.* with opposite fellow. **Lingua'lis**: up- and inwards to under surface of tongue (ranine); runs parallel with hypoglossal nerve. **Hyoid'e'a**, along superior border bone, supplying muscles, *anas.* with opposite fellow. **Dorsa'lis lin'gua**, ascends to dorsum tongue *anas.* with opposite fellow, supplying mucous membrane, tonsil, epiglottis, soft palate, etc. **Sublingua'lis** runs for- and

outwards to sublingual gland, supplies it, adjacent muscles, membranes, etc. *Xanti'na*, on lingualis to tip of tongue, accompanied by gustatory nerve; *anas.* with opposite fellow, supplying adjacent parts. **Facial's:** near angle inferior maxillary obliquely for- and upwards to maxillary gland, then up over jaw, up- and forwards to angle of mouth, along side of nose to inner canthus of eye (angular.) **CERVICAL BRs.:** *Palati'na ascen'dens*, between stylo-glossus and stylo-pharyngeus, to outer side pharynx, supplying muscles, tonsil, Eustachian tube, etc.; divides, one branch going up tensor palati to supply soft palate, glands, etc., the other branch goes to tonsil *anas.* with tonsillar. *Anas.* posterior palatine of internal maxillary. *Tonsilla'ris*, up to supply this gland and root of tongue. *Submaxilla'res* (3 or 4), supplying this gland and adjacent parts. *Submenta'lis*, off just as facial quits submaxillary gland, running forwards upon mylo-hyoid, supplying it and digastric (*anas.* with sublingual) to symphysis; the superficial branch turns round the chin, passing up to *anas.* with inferior labial, supplying muscles and integument; the deep branch runs up on bone to supply deep muscles and lip, *anas.* with inferior labial and mental. **FACIAL BRs.:** *Muscula'res*, to internal pterygoid, masseter, buccinator. *Labia'lis infe'rior*, beneath depressor anguli oris to lower lip, *anas.* inferior coronary, mental branch of dental, etc. *Corona'ria infe'rior* beneath depressor anguli oris along edge lower lip, supplying adjacent parts and *anas.* with opposite fellow, inferior labial, and mental branch of inferior dental. *Corona'ria supe'rior* along edge of upper lip, *anas.* with opposite fellow, supplying adjacent parts, septum and ala of nose. *Latera'lis na'si*, supplying side and dorsum of nose, septum, *anas.* opposite fellow, infra-orbital and nasal branch ophthalmic. *Angula'ris*, terminal branch, ascends up to inner canthus, *anas.* with nasal branch ophthalmic. **Occipita'lis:** from posterior part near inferior margin of digastricus, up between atlas and mastoid process, horizontally across occiput, then up to vertex, then dividing into numerous branches. *Muscula'res*, to digastricus, stylo-hyoid, stylo-mastoid, splenius capitis, trachelo-mastoid. *Auricula'ris*, to posterior surface concha. *Meningea infe'rior* along side internal jugular vein through foramen lacerum to dura in posterior fossa. *Arteria princeps cervicis*, descends back part neck, superficial branch supplying splenius and trapezius, *anas.* with superficial cervical; the deep branch *anas.* with vertebral and cervical branch superior intercostal; supplies adjacent parts. **Craniales,** to mus-

cles and integument of posterior surface cranium. *Auricula'ris post'e'rior*: from above stylo-hyoid, ascends beneath parotid gland, to groove between mastoid process and ear cartilage, dividing into anterior and posterior branches, the former passes forwards to *anas.* with temporal; the latter, back to *anas.* with occipital. *Stylo-mastoid'e'a*, enters do foramen supplying cells, tympanum, and semi-circular canals. *Auricu-la'ris*, to back part of cartilage of ear, and, penetrating, to its anterior surface. *Pharynge'a ascen'dens*: (smallest branch) deep-seated, arising near commencement of external carotid, up, between internal carotid and pharynx, to base of skull. *Ex-ternal branches*, to recti antici muscles, glands of neck, sympathetic, pneumogastric and hypoglossal nerves; *anas.* with ascending cervical. *Pharynge'a* (3 or 4) to parts of pharynx and adjacent muscles, etc. *Mening'e'a* backwards through foramen lacerum posterius, another branch through foramen lacerum basis cranii, another through anterior condyloid foramen to dura mater. *Tempora'lis*: from parotid gland up to root zygoma, dividing into anter.or and posterior. *Transverse facie'i*, in parotid gland, runs across face, supplying glands, integument and muscles, *anas.* with facial and infra-orbital. *Tempora'lis me'dia*, above zygoma to temporal muscle and orbicularis, *anas.* with lachrymal and palpebral branches of ophthalmic and deep temporal branches of internal maxillary. *Auricula'ris anterie'res* to anterior ear, *anas.* with posterior auricular. *Tempora'lis ante'rior* forwards over forehead, supplying integument, muscles, etc., *anas.* with frontal and supra-orbital. *Tempora'lis poste'rior*, up- and back-wards over side of head, *anas.* with opposite fellow, posterior auricular and occipital. *Maxilla'ris inter'na*: (see external carotid) inwards to inner side of condyle inferior maxilla into spheno-maxillary fossa, to supply deep structures of the face. MAXILLARY PORTION: *Cal'vi tym'pani* (tympanic) up through fissura Glaseri, supplying membrana tympani, laxator tympani, *anas.* with stylo-mastoid and Vidian. *Mening'e'a me'dia*, from internal lateral ligament of jaw up through foramen spinosum, dividing into anterior and posterior branches, supplying anterior and posterior surface of dura and bones, facial nerves, and branches to other parts; *anas.* with opposite fellow, anterior and posterior meningeal. *Mening'e'a par'va*, through foramen ovale to Casserian ganglion and dura; also to nasal fossa and soft palate. *Alveola'ris infe'rior*, (inf. dental) with dental nerve to foramen on ramus, then along dental canal supplying teeth, etc., till opposite bicuspid tooth, then

divides into incisor and mental branches, the former to incisor teeth, *anas.* with opposite fellow; the latter passes out mental foramen, *anas.* with inferior labial, inferior coronary, submental and supplies adjacent parts. Mylo-hyoid branch given off just as artery enters inferior dental foramen; it runs in its groove to its muscle. **PETERYGOID PORTION:** *Temporales profundæ* (2) anterior and posterior branches up to temporal muscle. *Pterygoideæ*, to do muscles. *Masseterica*, to do muscle. *Buccalis*, to do muscles. **SPHENO-MAXILLARY PORTION:** *Alveolaris*, common branch with following, supplying (superior dental) teeth, antrum and gums. *Infra-orbitalis*, continuation of main artery, along infra-orbital canal, and out infra-orbital foramen, supplying inferior rectus and inferior oblique, antrum, front teeth, lachrymal sac, etc.; *anas.* with facial, buccal, nasal branch ophthalmic, etc. *Palatina descendens*, down posterior palatine canal to gums, mucous membrane, palate, etc. *Vidianæ*, through its canal, with nerve, to pharynx, Eustachian tube and tympanum. *Pterygo-palatina*, to upper part pharynx and Eustachian tube. *Spheno-palatina* (nasal), to mucous membrane of nose, septum, antrum, ethmoid and sphenoid cells.

**CAROTIS INTERNA:** (8 brs.) Superior border thyroid cartilage up through carotid foramen in temporal bone; in the skull it runs forwards in a course represented by *\* [italic f laid horizontally.] No branches from cervical part. Tonsil is internal to it. *Tympanica*: to tympanum. *Receptaculum*: small branches to cavernous sinus, pituitary body, Casserian ganglion, etc. *Ophthalmica*: at inside anterior clinoid process, forwards through optic foramen to inner canthus, dividing into frontal and nasal. *Lachrymalis*, to lachrymal gland, conjunctiva; malar and meningeal branches; *anas.* freely with temporal, palpebral, etc. *Supra-orbitalis*, out supra-orbital foramen to muscles and skin of forehead and pericranium; *anas.* with temporal, facial, etc. *Ethmoidales*, (2) anterior and posterior to ethmoidal cells and meninges. *Palpebrales*, (2) superior and inferior, encircle eyelids, down nasal duct, *anas.* with temporal, inferior orbital, etc. *Frontalis*, out inner angle orbit to forehead, supplying adjacent parts, *anas.* with supra-orbital. *Nasalis*, to lachrymal sac, then down the nose, supplying its whole surface; *anas.* with facial, etc. *Ciliares breves*, (12—15) supply choroid and ciliary processes. *Ciliares longæ*, (2) to ciliary ligament and iris. *Ciliares anteriores*, from muscular branches, to iritic arterial circle. *Centralis retinae*, pierces optic nerve and runs in it to retina.

*Musculæres*, (2) superior and inferior to muscles of eye. *Cerebri arteria anterior*: at fissure of Sylvius forward in the great longitudinal fissure, *anas.* with its fellow by *anterior communicans*; curves round anterior border corpus callosum, running back to its posterior part to *anas.* with posterior cerebral supplying olfactory and optic nerves, inferior surface anterior lobes, 3d ventricle, anterior perforated space, corpus callosum and inner surface of hemispheres. *Cerebri arteria media*: (largest branch,) obliquely outwards along fissure of Sylvius, dividing into *anterior* branch to pia of anterior lobe, *median* branch to small lobe at extremity of Sylvian fissure; *posterior* branch which supplies middle lobe; *small* branches to corpus striatum through substantia perforata. *Communicans posterior*: from back part of artery backwards, *anas.* with posterior cerebral of basilar. *Choroidæ anterior*: from back part of artery back- and outwards, entering descending horn of lateral ventricle; is distributed to hippocampus major, corpus fimbriatum and choroid plexus.

**VERTEBRAL S:** (6 brs.) 1st and largest branch of subclavian. Enters foramen in transverse process of 6th cervical vertebra and ascends in these cervical foramina to the axis, then outwards, piercing occipito-atloid ligament and dura, passing through foramen magnum along in front of medulla, unites with opposite fellow to form basilar. *Spinales laterales*, enter spinal canal through the intervertebral foramina and supply (anterior branches) the cord and membranes and (posterior branches) posterior surface of vertebral bodies. *Musculæres*: deep muscles of neck, *anas.* with occipital and deep cervical. *Posteriore meningeæ*, (2) to falx cerebelli. *Spinalis anterior*, given off near termination, unites with opposite fellow, and descends on cord, *anas.* with spinal branches through the intervertebral foramina down to sacrum. Supplies pia of cord (being placed beneath it) and cord. *Spinalis posterior*, arises at side of medulla and passes down posterior surface of cord, being reinforced similarly to the anterior spinal, to sacrum. *Inferior cerebellaris*, winds back over medulla, to under surface of cerebellum, there dividing, the inferior branches going backwards to notch between the two hemispheres, the external branch supplying the inferior surface-*anas.* with superior cerebellar; branches, also to choroid plexus, 4th ventricle.

**BASILLARIS:** (see above) from posterior to anterior borders of pons, there dividing into posterior cerebral. *Transverseæ*, to pons, internal auditory meatus, under surface cerebellum

(ant. cerebellar). *Superior cerebella'ris*, near end basilar, up over cerebellum, supplying it, pineal gland, velum interpositum. *Posterior cerebralis*, winds round crus cerebri to inferior surface of posterior cerebral lobes, supplying them, and choroid plexus, *anas.* with anterior and middle cerebral.

**Circle of Willis:** (10); from behind forwards: basilar, 2 posterior cerebral, 2 posterior communicating, 2 internal carotids, 2 anterior cerebral, anterior communicating.

**Inferior Thyroid's:** (see arteries of upper extremity) branch of thyroid axis, up behind sheath of common carotid and sympathetic nerve to under surface of thyroid gland, *anas.* with opposite fellow, and superior thyroid. *Laryngealis*, to back part larynx. *Tracheales*, to trachea, *anas.* with bronchial. *Esophageales*. *Cervicalis ascenden's*, up neck, supplying muscles, vertebræ, cord and membranes.

**Cervical profunda:** (see arteries of upper extremity) branch of superior intercostal, ascends back part of neck, below complexus, to axis, supplying adjacent parts, and *anas.* with branches of vertebral and princeps cervicis of occipital.

## VEINS.

**Ve'na Diplo'e:** walls only of epithelium, with many *culs-de-sacs*. *Frontalis*, opens into supra-orbital through supra-orbital notch. *Temporalis anterior* opens into deep temporal. *Temporalis posterior* confined to parietal region, opens into lateral sinus. *Occipitalis*, opens into occipital vein or sinus.

**Cerebra'les:** noted for their thin coats, muscular tissue and absence of valves. *Superiores*, (7 or 8 on each side) for- and inwards to superior longitudinal sinus, there receiving interior cerebral which drain the same hemisphere. *Inferiores anteriores*, under surface of anterior lobes; terminate in cavernous sinus. *Inferiores laterales*, (3 to 5) terminate in lateral sinus. *Inferiores Médix*, from posterior lobe, etc., to straight sinus behind venæ Galeni. **Ve'na Cava'li** (2, one from right, one from left ventricle) formed by ve'na corpo'ris striati and ve'na choroïde'a; pass back and out of transverse fissure to straight sinus. *Cerebella'res*, superior, inferior and lateral sets; the 1st open into straight, the 2d into lateral, the 3d into superior petrosal sinus.

**Sinus:** (16 in No.) *Superior longitudinalis*, beings at crista Galli, runs back over cerebrum to torcular Herophili; receives superior cerebral and parietal veins. *Inferior longitudinalis*, along posterior part free margin of falx cerebri to straight sinus. *Tentorii* (straight), junction of tentorium and "

cerebri to torcular Herophili; receives inferior longitudinal sinus, venæ Galeni, inferior median cerebral, and superior cerebellar veins. *Laterales*, (2) from torcular to foramen lacerum posterius into internal jugular vein, receives straight and occipital sinus, etc. *Occipitales*, (2) smallest; posterior margin of foramen magnum to torcular. *Caverni*, (2) sides of sella Turcica from sphenoid fissure to apex petrous part of temporal. Receives ophthalmic vein connecting the frontal with these sinus; also inferior anterior cerebral veins. *Circulares*, surrounds pituitary body, communicates with each cavernous. *Inferiores petrosales*, (2) termination of cavernous to internal jugular vein. *Transversus*, connects the inferior petrosales across basilar process of occipital. *Superiores petrosales*, (2) on superior border petrous part of temporal, connecting lateral and cavernous; receives inferior lateral cerebral, anterior lateral cerebellar veins.

*Vena Facialis*: obliquely across side face from inner canthus, to unite, under inferior maxilla, to form a trunk for internal jugular. Receives *supra-orbitalis*, *supra-palpebralis*, *nasal*, *inferior palpebralis*, *frontalis*, *supra-orbitalis*, *supra-labialis*, *inferior labialis*, *buccalis*, *masseterica*, *submentalis*, *inferior palatina* (which arises from plexus about tonsil, etc.), *submaxillaris*, *ranina*; also communicates with ophthalmic (see cavernous sinus).

*Temporalis*: from side and vertex of head, uniting with internal maxillary forms temporo-maxillary. Receives *parotidea*, *anterior aures*, *transversa faciei*.

*Maxilla Interna*: *media meningeal*, *temporalis profunda*, *pterygoidea*, *masseterica*, *buccalis*, *palatina*, *inferior dentalis*, forms, with above, temporo-maxillary.

*Temporo-Maxilla*: union of temporal and internal maxillary, descends in parotid gland and divides, one branch going to join facial, the other to external jugular. Receives posterior auricular.

*Posterior auricular*: plexus side of head, receives *stylomastoid* and branches from external ear; empties into temporo-maxillary.

*Occipitalis*: (from plexus), back part vertex of skull deeply between muscles of neck lying in course of artery, to internal jugular. Receives *mastoid*, which communicates with lateral sinus.

*Jugularis Externa*: from temporo-maxillary near angle lower jaw, down into subclavian accompanied by auricularis magnus nerve. Has a pair of valves. Receives *occipitalis*, *posterior*



*jugula'ris externa* (draining superficial muscles of back of neck), *supra-scapula'ris*, *transverse cervicis*.

*Anterior jugula'ris*: drains integument and superficial muscles of anterior and middle portion of neck, emptying into subclavian. No valves.

*Jugula'ris interna*: from jugular foramen at junction of lateral and inferior petrosal sinus, vertically down the side of neck (outer side of main arteries), uniting with subclavian to form *vena innominata*; 1 pr. valves,  $\frac{3}{4}$  inch above termination. Receives *facia'lis*, *lingua'lis*, *pharyngea*, *superior thyroidea*, *media thyroidea*.

*Vertebra'lis*: drains occipital region and deep muscles of back of neck; enters foramen in transverse process of atlas down through similar foramina of the cervical vertebræ to 6th (or 7th) where it passes out to enter v. *innominata*. Receives *posterior condyloidea*, *musculares*, *dorso-spinales*, *meningio-achidia'nae*, *ascendens* and *profunda cervicales*. 1 pr. valves guard its mouth.

## NERVES.

**CRANIAL.** 1st or *Nervus olfactus*.—From corpus striatum, middle and anterior lobes of cerebrum. *Supplies* the Schneiderian membrane. *Special function*, smelling.

2d or *Opticus*.—From optic thalami and the corpora geniculata et quadrigemina, out through optic foramen to retina. *Special function*, sight.

3d or *Motorius Culi*.—From crus cerebri and pons (?) out through foramen lacerum anterius to all the muscles of the orbit, save the superior oblique and external rectus; a few filaments pass to the iris. Is a motor nerve.

4th or *Patheticus*.—From valve of Vieussens, through foramen lacerum anterius to superior oblique. Is a motor.

5th or *Trigeminus*.—The *sensory*, or posterior root, from the lateral tract of the medulla, the pons, and cerebellum (middle peduncle). The *motor* root from the pyramidal body. The *sensory* supplies are to the eye-ball (iris, ciliary body, etc), lachrymal gland, conjunctiva, Schneiderian membrane, all the muscles and integument about the eye-ball, orbit, os frontalis, nose, mouth, cheek, lips, temple, superior portion of pharynx, tongue, gums, and teeth. *Motor* filaments are given to the external and internal pterygoid, temporal, buccinator, and masseter muscles. *Special* sensation (taste) to mucous membrane of mouth, gums, tongue (anterior and middle portion), sub-lingual gland, conical and fungiform papillæ.

**BRs.—I. OPHTHALMICUS:** *sensory*; forward through sphenoidal fissure from Casserian ganglion, joined by cavernus plexus of sympathetic. *Lachrymalis*. *Frontalis*; (a) supra-trochlearis, (b) supraorbital. *Nasal*; ganglionic, long ciliary (2 or 3), infra-trochlear branches. **II. SUPERIOR MAXILLARIS**; sensory: forwards through foramen rotundum from Casserian ganglion appearing on face through infra-orbital foramen. *Orbitalis*; (a) temporal, (b) malar branches. *Spheno-palati* (2). *Posterior dentales* (2); (a) anterior branches, (b) posterior branches. *Anterior dental*. *Palpebrales*. *Nasales*. *Labiales*. All inosculate with branches from facial. **III. INFERIOR MAXILLARIS**: sensor root from Casserian ganglion, motor unites with it after passing through foramen ovale. **ANTERIOR DIVISION**: (a) masseteric, (b) deep temporal, (c) buccal, (d) pterygoid branches. **POSTERIOR DIVISION**: *Auriculo-temporal*; (a) anterior temporal, (b) posterior temporal (out under cover of parotid), (c) communicating with facial, (d) inferior and superior auricular, (e) 2 branches to meatus, (f) branches to temporo-maxillary articulation, (g) branches to parotid gland. *Gustatorius*, side of tongue to lip; (a) communicating branches, (b) branches of distribution to tongue, gums, etc. *Inferior dental*, in dental canal inferior maxilla to teeth, etc.; (a) mylo-hyoid to do muscle, etc., (b) dental branches.

**6th or Abducens.**—From pons, corpus pyramidale and medulla through foramen lacerum anterius to supply motor influence to the rectus externus oculi.

**7th or Facialis.**—From lateral tract medulla and 4th ventricle, out through stylo-mastoid foramen to *all* the muscles of the face, ear and their integument, the platysma, buccinator, digastric, stylo-hyoid, lingualis, stapedius, laxator and tensor tympani, levator palati, and azygos uvulæ. Is essentially a motor nerve. *Tympanicus*. *Chorda tympani*. *Posterior auricular*; (a) auricular branch, (b) occipital branch. *Stylo-hyoidæus*. *Digastric branch*. *Temporo-facial*; (a) temporal branches, (b) infra-orbital, (superficial and deep branches), (c) malar branches. *Cervico-facial*; (a) buccal, (b) supra-maxillary branches, (c) infra-maxillary branches.

**8th or I. Glossopharyngeus, II. Pneumogastricus, III. Spinalis Accessorius.**—I. and II. from floor of 4th ventricle; III. from lateral tract of cord as low as 6th cervico-spinalis, and also from medulla just below origin of I. and II. Part I. passes out through foramen lacerum posterius to supply *sensation* to *mucous membrane* of pharynx, fauces, Eustachian tube,

tympanum, and tonsil; *motor* influence to the pharyngeal muscles; *gustation* to posterior third of tongue and its lateral papillæ. Branches of *communication* (sympathetic, facial,) tympanic); *Carotid* branches. *Pharyngeal* branches. *Muscular* branches. *Tonsillar* branches. *Lingual* branches. Part II, through foramen lacerum posterius to supply *motor* and *sensor* filaments to the muscles and parts about the pharynx, larynx and trachea concerned in speech and respiration; *motor* filaments to the pharynx, heart, œsophagus, stomach, and filaments to the splenic and hepatic plexi. *Auricula'ris*. *Pharyngeal branch*. *Superior laryngea'lis*. *Recurrens* (or inferior *laryngea'lis* (the motor of larynx). *Cervico-cardiac* (2 or 3 in number). *Thoracico-cardiac*. *Anteriores pulmona'res* (2 or 3 in number.) *Posterior pulmona'ris*. (*Esophagea'les*. *Gastric* branches. Part III, supplies motor filaments to sterno-mastoideus and trapezius. The accessory part arising from lateral tract of cord, the spinal portion as low down as 6th cervical nerve, passing up in spinal foramen into skull, then out, with the accessory portion, through jugular foramen.

**9th or Hypoglossus.**—From floor of medulla. Is the *motor* of the tongue. Out through anterior condyloid foramen to supply the genio-hyoid, genio-hyo-glossus, hyo-glossus, stylo-glossus, thyro-hyoid, sterno-hyoid, omo-hyoid, and sterno-thyroid muscles. Is deep-seated (beneath internal carotid), but finally curves over externally to the carotid to muscles for distribution. Has *branches of communication* with pneumogastric, sympathetic, 1st and 2d cervical and gustatory. *Descendens noni* (on carotid sheath), joining with 2d and 3d cervical. *Thyro-hyoid* branch. *Muscular* branches.

**CERVICALIS:** each increase in size from 1st to 5th; 8 pairs in all. Have anterior and posterior branches, the latter having ganglionic enlargements. The 1st, or *sub-occipital*, (anterior branch) has exit between atlas and occiput, the remaining 7 between their respective vertebræ. The 4 upper (anterior branches) unite to form the cervical plexus; the 4 lower (anterior) with the 1st dorsal form the brachial plexus.

**Cervicospexus;** SUPERF. BRS. *Superficialis colli*, from 2d and 3d; obliquely forwards to anterior and lateral parts of neck. *Auricula'ris magnus*, from 2d and 3d; ascends to parotid gland, having facial, posterior auricular and mastoid branches. *Occipitalis minor*, from 2d; ascends to side of head; has auricular branch. *Supra-clavicula'res*, from 3d and 4th; downwards, having sternal, clavicular, and acromial

4th anterior surface and external border radius. [Anterior interosseous.]

(10) RADIAL REGION 3.

**Supina'tor lon'gus**: upper  $\frac{2}{3}$  external condyloid ridge humerus, septum—styloid process radius. [Musculo-spiral.]

**Exten'sor car'pi radia'lis l'n'gior**: lower third external condyloid ridge humerus, septum—base metacarpus indicis. [Musculo-spiral.]

**Exten'sor car'pi radia'lis br'vior**: common tendon external condyle humerus, external lateral ligament, septa—base metacarpus middle finger. [Posterior interosseous.]

(11) POSTERIOR BRACHIAL REGION, SUPERFICIAL LAYER, 4.

**Exten'sor commu'n's dig to'r'm**: common tendon external condyle humerus, septa—2d and 3d phalanges. [Posterior interosseous.]

**Ext'n's r'm'in'ini dig'iti**: external condyle humerus, septa—unites with tendon extensor communis digitorum to be inserted into 2d and 3d phalanges of little finger. [Posterior interosseous.]

**Exten'sor car'pi ulna'r's**: common tendon external condyle humerus, middle 3d posterior border ulna, fascia—base 5th metacarpus. [Posterior interosseous.]

**A'ccot'u'i**: back part outer condyle humerus—side, olecranon and upper posterior 3d ulna. [Musculo-spiral.]

(12) POSTERIOR BRACHIAL REGION, DEEP LAYER, 5.

**S'pina'tor lro'vis**: external condyle humerus, external lateral and orbicular ligaments, oblique line ulna—(surrounds radius at its upper part) back part inner surface; outer edge bicipital tuberosity; oblique line of radius. [Posterior interosseous.]

**Exten'sor o'vis metacar'pi p'o'licis**: posterior surface shaft ulna and radius (middle 3d), interosseous membrane—base 2st metacarpus. [Posterior interosseous.]

**Exten'sor p'rimi interne'di p'ol'licis**: posterior surface radius, interosseous membrane—base 1st phalanx of thumb. [Posterior interosseous.]

**Ex en'sor secun'di l'ro'er o'dii p'ol'licis**: posterior surface ulna, interosseous membrane—base 2d phalanx thumb. [Posterior interosseous.]

**Ex e'sor in'f'ol'i**: posterior surface ulna, interosseous membrane—joins tendon extensor communis digitorum to 2d and 3d phalanges indicis. [Posterior interosseous.]

(13) THUMB, RADIAL REGION, 4.

**Ab'duc'tor pol'lic's**: ridge trapezium and annular ligament—radial side base 1st phalanx thumb. [Median.]

**Oppo'ne's po'licis**: palmar surface trapezium, annular ligament—whole length 1st metacarpus, radial side. [Median.]

**Flex'or bre'vis pol'icis**: trapezium, outer  $\frac{2}{3}$  annular ligament, trapezoid, os magnum, base 3d metacarpus, tendon flexor carpi radialis—both sides base 1st phalanx thumb. [Median, ulnar.]

**Adduc'tor po'licis**: whole length 3d metacarpus—ulnar side base 1st phalanx thumb. [Ulnar.]

(14) LITTLE FINGER, ULNAR REGION, 4.

**Palma'ris bre'.l.**: annular ligament palmar fascia—skin inner border palm. [Ulnar.]

**Abd o' er min'ni dig'iti**: pisiform bone, tendon flexor carpi ulnar's—ulnar side base 1st phalanx little finger. [Ulnar.]

**Flex'or bre'vis min'ni dig'iti**: tip unciform, process annular ligament—base 1st phalanx little finger. [Ulnar.]

**Oppo'ne's min'ni dig'iti**: unciform process annular ligament—ulnar side 5th metacarpus. [Ulnar.]

(15) MIDDLE PALMAR REGION 3.

**Lumb los'es**: (4); accessories to flexor profundus digitorum—tend n extensor communis digitorum. [Median and Ulnar.]

**I teros'e dor.s'es**: (4); metacarpi—base 1st phalanges 1st, 2d, 3d fingers. [Ulnar.]

**Inter'o'sci pa'ma'ros**: (3); 2d, 4th and 5th metacarpi—1st phalanges of same fingers. [Ulnar.]

## ARTERIES.

**SUB'CLAVIA**: (4 brs.) *Right*, 1. from innominate at sterno-clavicular articulation to inner margin scalenus anticus. (*Left*, 1. from transverse portion aortic arch opposite 2d dorsal vertebra to scalenus anticus); II internal border scalenus anticus to outer of scalenus medius III. from external border scalenus medius to lower border 1st rib, midway along clavicle. **Verte-bra'lis**, upper and back portion of part 1.—enters foramen 6th cervical vertebra to be continued upwards (see page 10). **Thy-roide'u; ax'is**, anterior part of first portion, inner side scalenus anticus. *Infe'rior thyroide'a* (see page 11). *Transversa'lis colli*, (a) superficial cervical beneath anterior margin trapezius—to trapezius and glands in that region. (b) Poste'rior scapula'ris to superior angle of scapula to anastomose at the inferior angle with subscapular. *Supra-scapula'ris*—outwards and backwards parallel with clavicle to supra-spinous fossa; distributed to muscles in that region. **Ster'a'lis inter'na** (mammary), origin just below thyroid axis, behind clavicle along

inside chest to 6th intercostal space, there dividing into musculo-phrenic and superior epigastric. *Cómes nervi phrenici*, to diaphragm; anastomoses with other phrenic branches. *Mediastinales*, to areolar of anterior mediastinum, also remains of thymus. *Pericardiales*, to upper pericardium, triangularis sterni, *anas.* musculo-phrenic. *Anteriores intercostales*, to 5 or 6 upper intercostal spaces, to intercostal and pectoral muscles and mammary gland; *anas.* aortic intercostal. *Perforantes*, to 5 or 6 upper intercostal spaces, to pectoral muscles and mammary gland. *Musculo-phrenica*, perforates diaphragm at 8th or 9th rib, supplying intercostal spaces, diaphragm and abdominal muscles. *Epigastrica superior*—down behind rectus to supply that muscle and others near it; *anas.* with inferior epigastric. *Superior intercostales*, upper and back portion iid part to 1st and 2d intercostal spaces, supplying spinal muscles and cord; *anas.* aortic intercostals. *Profunda cervicis*—back to 7th cervical vertebra and between complexus and semi-spinalis colli runs to axis, supplying contiguous muscles, *anas.* anterior princeps cervicis.

**AXILLARIA:** (7 brs.) lower border 1st rib to tendons latissimus dorsi and teres major; 1st part, 1st rib to pect. minor; iid, from superior border pectoralis minor to inferior border same; iiii, from inferior border pectoralis minor to tendon latissimus dorsi. *Superior Thoracica*, 1st part—forwards and inwards along superior border pectoralis minor, supplying pectoral muscles; *anas.* internal mammary and intercostal. *Acromialis Thoracica*, 1st part to upper border pectoralis minor; *Acromiales*, towards acromian process to deltoid; *anas.* suprascapular and posterior circumflex. *Thoracica*, 2 or 3 in number, supplying serratus magnus and pectoral muscles; *anas.* intercostals of internal mammary. *Descending* branches supply pectoralis major and deltoid, as accompanying cephalic vein. *Thoracica longa*, ii. part, down- and inwards along inferior border pectoralis minor to pectoral muscles, axillary and mammary glands, serratus magnus and subscapularis; *anas.* internal mammary and intercostal. *Thoracica alata*, ii. part, to glands and areolar tissue of the axilla. *Subscapularis*, iii. part, opposite inferior border do muscle, down and back inferior margin do muscle to inferior angle scapula; *anas.* posterior scapular. *Dorsalis scapulae*—dividing into 3 branches, “subscapular,” “infra-spinous,” and “median.” Altogether they supply the scapular, latissimus dorsi and serratus magnus muscles. Make a general anastomosis. *Posterior circumflexa*, opposite inferior border subscapularis, winds round neck

humerus to supply deltoid; *anas.* anterior circumflex, supra-scapular, acromio-thoracic. *Anterior circumflexa*, just below above, passes anterior to humerus supplying deltoid; *anas.* posterior circumflex, acromio-thoracic.

**BRACHIALIS:** (5 hrs.) inferior border teres major to  $\frac{1}{2}$  inch below bend of elbow. Runs along inner border biceps and coraco-brachialis; is superficial. *Superior profunda*, opposite inferior border trochanter major, winds backwards in spiral groove down to elbow; *anas.* recurrent radial; supplies deltoid, coraco-brachialis, triceps. *Posterior articularis*, perpendicular down to back of elbow-joint; *anas.* interosseous recurrent, posterior ulnar recurrent, anastomotica magna. *Nutria*, middle of arm to bone near insertion coraco-brachialis. *Inferior profunda*, just below middle arm to *anas.* posterior ulnar recurrent and anastomotica magna at elbow; accompanied by ulnar nerve. *Anastomotica magna*, 2 inches above elbow-joint—winds round and down humerus to elbow-joint; *anas.* posterior ulnar recurrent, inferior profunda, anterior ulnar recurrent. *Musculares*, 3 or 4, to coraco-brachialis, brachialis anticus.

**RADIALIS:** (12 hrs.) end of the brachialis down radial side forearm, along inner border supinator longus to wrist; then winds around carpus beneath thumb-extensors to enter palm of hand between thumb and index finger to form "deep palmar arch"; *anas.* deep branch of ulnar. *Radialis recurrentis*, below elbow—up arm supplying brachialis anticus, supinator longus, supinator brevis, *anas.* superior profunda. *Musculares*, to radial side forearm. *Superficialis volae*, just as artery about to wind around the carpus—to muscles in ball of thumb; *anas.* with ulnar forming "superficial palmar arch." *Anterior carpalis*, to wrist; *anas.* anterior carpalis of ulnar. *Posterior carpalis*, to wrist; *anas.* posterior carpalis of ulnar, anterior interosseous, and posterior perforating of deep palmar arch as 2 *dorsal interosseous* branches. *Motacarpalis*, (1st dorsal interosseous) supplies adjoining sides index and middle fingers. *Dorsales pollicis*, (2) along dorsum of thumb. *Dorsalis indicis*, radial side back of index. *Princeps pollicis*, beginning palmar arch to sides of palmar aspect of thumb. *Radialis indicis*, palmar arch to radial side index. *Perforans*, (3), to inosculate with 3 dorsal interosseous. *Palmares interossei*, (3 or 4), from arch to *anas.* at finger-clefts with digital branches of superficial arch.

**ULNARIS:** (8 hrs.) little below bend of elbow—along radial side flexor carpi ulnaris to palm of hand, forming "superficial

palmar arch" with superficialis volæ. *Anterior ulnaris recurrentis*, just below elbow-joint—up and inwards between brachialis anticus and pronator radii teres, supplying these; *anas.* anastomotica magna, and inferior profunda. *Posterior ulnaris recurrentis*, just below preceding—back and inwards beneath flexor sublimis up to internal condyle humerus, supplying joint and neighboring muscles; *anas.* inferior profunda, anastomotica magna, interosseous recurrent. *Interossea*, short trunk below tuberosity radius—backwards to interosseous membrane, dividing into: *INTEROSSEA ANTERIOR*, passing down forearm on interosseous membrane, piercing membrane at superior border pronator quadratus to descend to back of wrist, supplying *nutrient* (to radial and ulnar arteries) and *muscular* branches; gives off *median* branch, accompanied by *do* nerve. *Anas.* posterior carpal of radial and ulnar. *INTEROSSEA POSTERIOR*, down back forearm, between deep and superficial muscular layers, to wrist, supplying these muscles; *anas.* as preceding. *Posterior interossea recurrentis*, near its origin to interval between olecranon and external condyle, beneath supinator brevis; *anas.* superior profunda, posterior ulnar recurrent. *Musculares*, to muscles of ulnar side of forearm. *Carpalis anterior*, beneath flexor profundus, *anas.* anterior carpal of radial. *Posterior carpalis*, above pisiform bone, beneath flexor carpi ulnaris, giving small branch to inosculate with posterior carpal of radial, forming "*posterior carpal arch*"; continued along 5th metacarpus, forming its dorsal branch. *Communeans*, from commencement palmar arch, deeply inwards, *anas.* with radial forming "*deep palmar arch*." *Digitalis*, (4) from convexity of superficial palmar arch, supplying ulnar side 4th and adjoining sides 3d, 2d and 1st fingers.

### VEINS.

*Ulnaris anterior*, from anterior carpus and ulnar side hand, up along ulnar side forearm to elbow-joint, to form basilica. Communicates with median and posterior ulnar.

*Ulnaris posterior*, posterior ulnar border hand and vein of little finger (*v. salvetella*)—unites with preceding just below elbow-joint.

*Basilica*, coalescence of anterior and posterior ulnares; receives median-basilic at elbow, ascends inner side arm to *venæ comites* of brachial artery, or axillary vein.

*Radialis*, dorsum thumb, radial side index and hand—at bend elbow receives median-cephalic to become the cephalic.



**Cephal'ica** up between deltoid and pectoralis major to axillary veins

**M'dia**: palmar surface of hand and middle of forearm (communicates with ulnar and radial), to median-cephalic and median-basilic at elbow.

**Cephal'ica m'dia**: obliquely outwards from bend elbow, between supinator longus and biceps; empties into cephalic as a formative branch.

**Basil'ica m'dia**: obliquely inwards behind biceps and pronator radii teres; empties into basilic as formative branch.

The following are the deep veins, and accompany their respective arteries as *venæ com'ites*, intercommunicating with each other, and the superficial veins, frequently.

**Digit'al'es**, (2) empty into the superficial palmar.

**Palma'res superficia'les**, (2) empty into ulnar and radial.

**Palma'res profun'dæ**, empty into radial *venæ com'ites*.

**Interos'eæ**, (2) accompany the anterior and posterior interosseous arteries, commencing at the wrist, terminating in *venæ com'ites* of the ulnar.

**Com'ites rad'a'lis**, form, with the ulnar, the *com'ites* of brachial.

**Com'l' os ulna'ris**, with the radial, form *com'ites* of brachial.

**Com'l' os brach'a'lis**, receiving veins corresponding to the branches of the brachial artery, empty into the axillary vein.

**Acilla'ria**, is the continuation of the basilic. Commences at lower border of the axillary space; receives veins corresponding to branches of its artery, and terminates in the subclavian at outer border 1st rib. [Valves at inferior border subscapularis, terminations of *vena subscapularis* and *vena cephalica*.]

**Sub'la'vis**, continuation of axillary, emptying into *vena innominata* at right sterno-clavicular articulation. Separated from its artery by scalenus anticus muscle and phrenic nerve. Receives external and anterior jugulars, branch from cephalic, and internal jugular. [Valves just external to entrance of external jugular, or about 1 inch from its termination.]

## NERVES.

**PLEXUS BRACHIA'LIS**: formed by anterior roots 4 lower cervical and 1st dorsal nerves. 5th and 6th cervical unite, then are joined by 7th to form *upper trunk*. 8th cervical and 1st dorsal unite to form *lower trunk*. Both trunks accompany the subclavian artery to the axilla, lying upon its outer side. Opposite clavicle, each of the trunks gives off a fasciculus, which, uniting, form a third trunk; in the centre of the

axilla the original *upper* cord lies to the *outside* of the artery ; the original *lower* cord to the *inside* ; the cord formed from fascicular union, *posteriorly*. The plexus lies between the anterior and middle scaleni, beneath the clavicle upon 1st serration of the serratus magnus and the subscapular muscles. (Has 4 brs. above, 9 below the clavicle.) Receives communicating branches from cervical plexus, phrenic, inferior cervical, sympathetic ganglia. *Communicans*, 5th cervical to phrenic on scalenus anticus. *Muscula' res*, to longus colli, scaleni, rhomboidei and subclavius. *Posterior thorac'ous*, from 5th and 6th cervical to serratus magnus. Passes behind brachial plexus. *Supra-scapula'ris*, from "outer cord" obliquely outwards beneath trapezius, to supra-spinous fossa through supra-scapular notch, here giving 2 branches to supra-spinatus muscle and 1 to joint; in infra-spinous fossa, 2 branches to muscle, 1 to joint; all of these are given off ABOVE the clavicle. Those BELOW the clavicle are: *Externus anterior thorac'ous*, "outer cord" inwardly across axillary vessels to pectoralis major. *Internus anterior thorac'ous*, "inner cord" passes up between axillary artery and vein (*sometimes perforating the vein*) to pectorales major and minor. *Subscapula' res*, (3) "posterior cord" the *upper* to subscapular muscles; the *longer* to latissimus dorsi; the *lower* to teres major. *Circumflex'us*, "posterior cord", down behind axillary vessels to lower border subscapularis, dividing into *upper* branch winding round neck of humerus, supplying deltoideus and integument; *lower* branch to teres minor, deltoideus and integument over posterior surface deltoid. *Articula'ris*, given off before division, to joint. *Musculo-cutaneus*, continuation of outer cord, *perforates coraco-brachialis*, obliquely outwards between biceps and brachialis anticus to these muscles, integument to elbow, and to the joint. *Anterior* branch, down radial border of forearm from elbow, to wrist, supplying integument to ball of thumb; communicates with radial. *Posterior* branch, given off middle of forearm, supplies integument to wrist, on radial side; communicates with radial and external cutaneous. *Inter-nus cutaneus*, "inner cord", down in company with brachial artery, becoming cutaneous at middle of arm, then dividing into *anterior* branch, supplying integument of ulnar side of arm to wrist, communicating with branch from ulnar; *posterior* branch down, on inner side of basilic vein, over internal condyle, on posterior ulnar side of forearm to wrist, communicating at wrist with dorsal branch of ulnar; at elbow, with lesser internal cutaneous. *Cutaneus m'us inter-nus*, from

"inner cord" to integument inner side of arm. *Medius*, (4 branches) arises by 2 roots, one from "outer" and one from "inner" cord; at first lies to outer side of the artery, crosses it at middle of arm; in forearm runs between the 2 heads of the pronator radii teres, beneath flexor sublimis till near annular ligament, when it lies between flexor sublimis and flexor carpi radialis; it passes beneath annular ligament to hand. (No branches in the arm.) *Muscula'res*, from near elbow, to all forearm muscles save flexor carpi ulnaris. *Anterior inter-osseus*, follows course of the artery, to flexor profundus digitorum, flexor longus pollicis, and pronator quadratus. *Cutaneus palmaris*, crosses annular ligament, the outer branch supplying the thumb-region; the inner branch, the palmar. *Digital'es*, (5) two go to thumb, the 3d to radial side of index; the 4th divides to supply adjacent sides of index and middle; the 5th the adjacent sides of middle and ring fingers, communicating with branches from ulnar. *Ulnaris*, (7 brs.); continuation of "inner cord", down ulnar side of arm and forearm (over the back of inner humeral condyle) upon flexor profundus digitorum, having ulnar artery externally, crosses annular ligament at outer side of pisiform bone, dividing into superficial and deep palmar branches. *Articula'res*, to elbow joint. *Muscula'res*, one to flexor carpi ulnaris, the other to flexor profundus digitorum. Both arise near elbow. *Cutaneus*, arises middle forearm, has a deep and superficial branch. *Dorsalis cutaneus*, arises 2 inches above wrist, passes to back of hand, supplying ulnar side of wrist, inner side of little finger, adjoining sides of little and ring fingers. *Articula'res*, to wrist. *Palmaris superficialis*, supplies palmaris brevis, and integument inner side of hand, ulnar side of the little and adjoining sides of the little and ring fingers. *Palmaris profundus*, follows course of "deep palmar arch", supplying muscles of interosseous spaces, lumbricales, adductor and flexor brevis pollicis. *Musculo-spiralis* (4 brs.; largest br. of plexus) continuation of "posterior cord"; winds around the humerus in spiral groove, etc., to front of external condyle, then divides into radial and interosseous. *Muscula'res*, to triceps, anconeus, supinator longus, extensor carpi radialis longior, and brachialis anticus. *Cutanei*, (3), internal branches supply integument of back of arm down to olecranon: external branches perforate external head of triceps, supplying integument lower anterior half of arm, the lower branch running down radial side of forearm (posteriorly) to wrist, supplying contiguous integument. *Re-*

*dia'lis*, down by outer side of radial artery, just concealed by supinator longus till within 3 inches of wrist, where pierces deep fascia of outer side forearm; divides to supply radial side of ball of thumb, (communicating with external cutaneous nerve), and on back of hand forms an arch with ulnar, giving off 4 *digital* nerves; the 1st to ulnar side of thumb; the 2d to radial side of index; the 3d, adjoining sides of index and middle; the 4th, adjoining sides of middle and ring fingers. *Interos'seus poste'rior*, pierces supinator brevis, winding to back of forearm, passing down to wrist, there having ganglionic enlargement. Supplies carpus, and all muscles on back of forearm *except* anconeus, supinator longus and extensor carpi radialis longior.

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## B O D Y .

### MUSCLES.

#### (1) BACK, FIRST LAYER, 2.

**Trape'zius**: inner 3d superior curved occipital line, ligamentum nuchæ, spinous processes of 7th cervical and all the dorsal vertebræ—posterior border clavicle, superior margin acromion process and superior border spine of scapula. [Spinal accessory, cervical plexus.]

**Latis'simus dor'sal**: aponeurosis from spinal processes 6 lower dorsal, all lumbar and sacral vertebræ, external lip iliac crest—twisting upon itself so as to be inserted into bicipital groove of humerus. [Subscapular.]

#### (2) BACK, SECOND LAYER, 3.

**Leva'tor an'guli scap'ulae**: transverse processes of 3 or 4 superior cervical vertebræ—posterior border scapula. [5th cervical, cervical plexus.]

**Rhomboid'e'us mi'nor**: ligamentum nuchæ, spinal processes 7th cervical and 1st dorsal vertebræ—down and outwards to root scapular spine. [5th cervical.]

**Rhomboid'e'us ma'ior**: spinal processes superior dorsal vertebræ—tendinous arch along vertebral border scapula. [5th cervical.]

#### (3) BACK, THIRD LAYER, 4.

**Serra'tus posti'cus supe'rior**: ligamentum nuchæ, spinal processes 7th cervical and 2 or 3 superior dorsal vertebræ—superior border 2d, 3d, 4th, 5th ribs. [Posterior external bra. cervical.]

**Serra'tus costi'cus infe'rior**: spinal processes 11th and 12th dorsal, 1st, 2d and 3d lumbar vertebræ—up and out to inferior border 4 inferior ribs. [External branches dorsal.]

**Splenius**: ligamentum nuchæ, spinal processes 7th cervical and 6 superior dorsal vertebræ—*capitis*, into mastoid process and occiput; *colli*, transverse processes 3 or 4 superior cervical vertebræ. [External posterior branches cervical.]

(4) BACK, FOURTH LAYER, SACRAL AND LUMBAR REGION, 1.

**Erector splinæ**: sacro-iliac groove, lumbo-sacral tendon, iliac crest, transverse processes sacrum—sacro-lumbalis, longissimus dorsi. [External posterior branches lumbar.]

(5) BACK, FOURTH LAYER, DORSAL AND CERVICAL REGION, 10.

**Sacro-lumbalis**: (see above)—angles inferior ribs. [Dorsal.]

**Accessorius**: angles 6 lower—angles 6 superior ribs. [Dorsal.]

**Cervicallis ascendens**: 4 or 5 superior ribs—transverse processes 4th, 5th, 6th cervical vertebræ. [Cervical.]

**Longissimus dorsi**: see erector spinæ, of which it is the larger portion; inserted (*lumbar* region) into transverse processes lumbar vertebræ; *dorsal*, into transverse processes of all vertebræ, and 7 to 11 ribs, between their tubercles and angles. [Lumbar, dorsal.]

**Transversalis colli**: transverse processes, 3d, 4th, 5th, 6th dorsal—transverse processes 5 inferior cervical vertebræ. [Cervical branches.]

**Trachelo-mastoideus**: transverse processes 3d, 4th, 5th, 6th dorsal, and articular processes 3 or 4 inferior cervical vertebræ—posterior margin mastoid process. [Cervical branches.]

**Spinalis dorsi**: spinal processes 1st, 2d lumbar and 11th and 12th dorsal vertebræ—spinal processes of dorsal vertebræ. [Dorsal branches.]

**Spinalis cervicis**: spinal processes 5th, 6th cervical (1st, 2d dorsal) vertebræ—spinal process axis (sometimes 3d and 4th cervical.) [Cervical branches.]

**Complexus**: transverse processes 7th cervical and 3 superior dorsal vertebræ, articular processes 4th, 5th, 6th cervical—between superior and inferior curved occipital lines. [Cervical branches, sub-occipital, great occipital.]

**Biventer cervicis**: 2 or 4 tendons from as many superior dorsal vertebræ—superior curved occipital line, inside of complexus [Cervical branches.]

(6) BACK, FIFTH LAYER, 8.

**Semispinalis dorsi**: transverse processes of vertebræ between 11th and 5th dorsal—spinal processes of 6th and 7th cervical and 4 superior dorsal vertebræ. [Dorsal branches.]

**Semispinalis colli**: transverse processes 4 superior dorsal and articular processes 4 inferior cervical vertebræ—spinal processes 2d, 3d, 4th, 5th cervical. [Cervical branches.]

**Multifidus spinæ**: fills groove on either side spinal processes back part sacrum, articular processes in lumbar and cervical region, transverse processes in dorsal region—spinal processes and laminæ of the 4 vertebræ above. [Posterior spinal branches]

**Rotatores spinæ**: (11) upper and back part transverse processes of dorsal vertebræ—inferior border and outer surface of laminæ of vertebræ above. [Dorsal branches.]

**Supra-spinales**: on spinal processes of cervical vertebræ. [Cervical branches.]

**Inter-spinales**: in pairs between spinal processes of adjacent vertebræ; 6 cervical, 3 dorsal (1st to 4th, and 11th to 12th), 4 lumbar. [Spinal branches.]

**Extensor Coccygis**: last bone sacrum—inferior part coccyx, lying on posterior surface.

**Inter-transversales**: 7 cervical, 12 dorsal, 4 lumbar, lying between transverse processes. [Spinal branches.]

#### (7) ABDOMINAL REGION 6.

**Obliquus abdominis externus**: 8 digitations from inferior borders 8 lower ribs—*down* to anterior  $\frac{1}{2}$  outer iliac crest, pubic spine and symphysis, linea alba. Poupart's ligament formed by its aponeurosis. [Inferior intercostal, ilio-hypogastric, ilio-inguinal nerves supply this and the 5 following muscles.]

**Obliquus internus**: outer  $\frac{1}{2}$  Poupart's ligament, anterior  $\frac{2}{3}$  middle lip iliac crest, lumbar fascia—pectineal line, linea alba, pubic crest, inferior edges cartilages of 4 inferior ribs.

**Transversalis**: outer  $\frac{1}{3}$  Poupart's, anterior  $\frac{2}{3}$  internal lip ilium, internal surfaces cartilages of 6 inferior ribs, aponeurosis from spinal and transverse processes lumbar vertebræ—pubic crest (forming with above "conjoined tendon"), lineæ ilio-pectinea and alba.

**Rectus abdominis**: pubic crest and symphysis—cartilages 5th, 6th, 7th ribs. (In sheath formed by internal oblique and transversalis aponeuroses.)

**Pyramidalis**: pubes—linea alba midway to umbilicus.

**Quadratus lumborum**: posterior 4th iliac crest, ilio-lumbar ligament—transverse processes 3d, 4th, 5th lumbar vertebræ and last rib.

#### (8) THORACIC REGION 5.

**Intercostales externi**: (11) outer lip of groove in inferior borders of ribs—*down* and *forwards* to superior border rib below. [Intercostal.]

**Intercostales interni**: (11) inner lip of groove—*down* and *backwards* to rib below. [Intercostal.]

**Intra-costal'es**: inferior surface of one rib—internal surface 1st, 2d or 3d rib below. [Intercostal.]

**Tri-angle's ster'ni**: side of gladi'olus, internal surface ensiform appendix, cartilage of 3 or 4 lower true ribs—cartilages of 2d, 3d, 4th, 5th ribs. [Intercostal.]

**Leva'tor costar'um**: (12) transverse processes dorsal vertebræ—superior border rib below, near angle. [Intercostal.]

(9) DIAPHRAGMATIC REGION 1.

**Diaphrag'ma**: internal surfaces 6 or 7 lower ribs, ligamenta arcuata, crures from 2d, 3d, 4th lumbar vertebræ, ensiform cartilage—converge forming common central tendon. *Aortic* opening for aorta, vena azygos major, thoracic duct; *oesophageal*, oesophagus and pneumogastric nerves; *vena cava*—superior inferior vena cava; *right crus* transmits sympathetic and greater and lesser splanchnics; *left crus*, vena azygos minor and splanchnics. [Phrenic.]

(10) PERINEAL REGION 8.

**Sphinc'ter ani**: tip of coccyx and fascia in front—common central perineal tendon. [Hemorrhoidal branch 4th sacral.]

**Sphinc'ter inter'nus**: muscular ring ( $\frac{1}{2}$  inch wide), 1 inch from anus, surrounding rectum.

**Accelera'tor urinæ**: central perineal tendon and raphe—covers bulb corpus cavernosum, and spongiosum, and dorsal vessels.

**Erec'tor pe'nis**: internal surface tuber ischii—sides and inferior surface crus.

**Transver'sus perina'i**: internal surface ascending ischic ramus—obliquely for- and inwards to central perineal tendon.

**Leva'tor ani**: inside of pubic ramus and body, ischic spine, fascia (angle of division into obturator and vesical)—central perineal tendon, rectum, coccyx; forms floor of pelvic cavity.

**Compre'ssor ure'thræ**: pubic ramus—surrounds membranous portion.

**Coccyge'us**: ischic spine and lesser sacro-sciatic ligament—side of coccyx and last sacral segment.

(In the female the above perineal muscles are essentially the same; the *erector clitoridis* takes the place of erector penis, being inserted into the sides of the clitoris; *sphincter vaginae* represents the accelerator urinæ of the male, surrounding the vagina.)

ARTERIES.

**ARCH OF AORTA**: (5 branches); from left ventricle, opposite middle of sternum, upwards for 2 inches, arching back-

wards over root of left lung (on level 2d dorsal vertebra), the "descending portion," runs down on the left side of 2d and 3d vertebræ, there becoming thoracic aorta. In front, are left pleura, lung, pneumogastric, phrenic, and cardiac nerves; behind, trachea, right pulmonary vessels and nerves, root of right lung, cardiac plexus, œsophagus, thoracic duct, left recurrent nerve. *Corona'ria dex'tra*: above free margin right semilunar valve, between pulmonary artery and right auricular appendix; runs round right border of heart to posterior interventricular groove, there dividing into 2 branches, supplying right heart; *anas.* at apex with left coronary. *Corona'ria sin'istra*: (smaller) above left semilunar valve, passes forwards between left auricular appendix and pulmonary artery to anterior interventricular groove, dividing into two branches, supplying left side of heart. *Innomina'ta*: commencement transverse portion of arch, ascends obliquely up to right sterno-clavicular articulation, dividing into common carotid and subclavian. *Carotis commu'nis sin'istra* and *Subclavia sin'istra*: (see pages 6 and 19.)

**AORTA THORACICA**: (see arch) 5 branches. Terminates at aortic opening in diaphragm as "abdominal aorta," there lying upon front of vertebral bodies. *Pericardiacœ*: to pericardium. *Bronchia'les*: (3 generally) to the left bronchus. *Œsophage'æ*: (4 or 5) front of aorta, obliquely down to œsophagus, *anas.* with inferior thyroid, gastric and phrenic. *Mediastina'les p'sterio'res*: glands and areolar tissue therein. *Intercosta'les*: (10 pairs) right longer than left; pass out to do spaces, there dividing into *anterior* branches ascending to inferior border rib above, the smaller branch of it on the superior border rib below, running towards sternum, *anas.* with internal mammary, thoracic branches of axillary, superior intercostal, epigastric, phrenic, lumbar, etc. *Posterior* branch passes backwards, supplying vertebræ, cord, and muscles of back. (1st space supplied by superior intercostal of subclavian.)

**AORTA ABDOM'INIS**: (9 brs.); from aortic opening of diaphragm, in front last dorsal vertebræ, terminates on body 4th lumbar, in the "common iliacs." *Phren'icæ*: (2) obliquely outwards to supply diaphragm, inferior vena cava, œsophagus and supra-renal capsule; *anas.* freely. *Cœli'aca*: (axis  $\frac{1}{2}$  inch long) horizontally forwards, dividing into *CORONA'RIA VENTRIC'ULI* (gastric), which passes round lesser curvature stomach from cardiac end to pylorus, there *inosc.* with *hepatic*. **HEPATICA**, to the transverse fissure of liver to supply right and left lobes, giving off *pyloric* branch to stomach,



running from right to left; *gas'tro-duodena'lis* that supplies greater curve of stomach (*gas'tro-epiplo'ica dex'tra*, which *inosc.* with *gas'tro-epiplo'ica sin'istra* of splenic), pancreas and duodenum (*pancreat'ico-duodena'lis*, which *inosc.* with duodenal branch of superior mesenteric); *cyst'ica*, small branch to gall bladder. *SPLEN'ICA*, horizontally left to spleen: *pancreat'ica* (*mag'na* and *par'va*) small branches to pancreas; *vis'a brev'ia*, 5 to 7 small branches to cardiac end of stomach; *gas'tro-epiplo'ica sin'istra*, around greater curve stomach from left to right, *anas.* *gas'tro-epiplo'ica dex'tra*. *Supra-rena'les*: obliquely up- and outwards to supra-renal capsules. *Mesenter'ica super'ior*:  $\frac{1}{4}$  inch below cœlic axis, to the intestines. *Infer'ior pancreat'ico-duodena'lis*, up to head pancreas and lower  $\frac{2}{3}$  duodenum, *anas.* with *pancreat'ico-duodena'lis* of hepatic. *V'is'a intesti'na tenu'is*, 12 to 15 looping branches to jejunum and ileum. *Ilio-col'ica*, down right obliquely, to ileum and cæcum. *Col'ica dex'tra*, horizontally to right to ascending colon. *Col'ica me'dia*, up to transverse colon, *inosc.* *colica dex'tra* and *colica sin'istra*. (Free anastomosis of all these vessels.) *Re'na'les*: sides aorta just below superior mesenteric horizontally outwards to each kidney. *Spermat'ion*: slender vessels supplying testicles, or ovaries. *Mes. enter'ica infe'rior*: left side aorta 2 inches above bifurcation, to sigmoid flexure of colon, and rectum. *Col'ica sin'istra*, horizontally to left to descending colon. *Sigmoid'e'e*, branches passing obliquely downwards to sigmoid flexure. *Hæmorrhoid'al'is super'ior*, termination of inferior mesenteric supplying superior part of rectum, *anas.* with middle hæmorrhoidal of internal iliac, and inferior hæmorrhoidal of internal pudic. The branches of both mesenteric arteries are in free anastomosis. *Lumba'les*: 4 pairs arising from back aorta, dividing, near transverse processes into *abdominal* branches (supplying muscles, and *anas.* with epigastric, internal mammary, intercostal, ilio-lumbar and circumflex iliac branches) and *dorsal* branches (supplying back muscles, etc., with a spinal branch to meninges and cord), *anas.* intercostal. *Sa'cra me'dia*: back of aorta at its bifurcation, down median line to coccyx, there *anas.* with lateral sacral, supplying adjacent parts.

**ILYACÆ COMMUNES**: from bifurcation of aorta, obliquely out- and downwards to intervertebral substance between sacrum and last lumbar, there dividing into internal and external iliac; each are about 2 inches long. Give small branches to peritoneum, ureters, osseæ, etc. The left is the larger.

**ILYACA INTERNA**: (see above);  $1\frac{1}{2}$  inches long, dividing

at greater sacro-sciatic foramen into anterior and posterior trunks. Branches from the ANTERIOR trunk are: *Vesica'lis superior*: part of foetal-hypogastric that remains pervious, to fundus of bladder, and vas deferens. *Vesica'lis media*: base of bladder and vesiculæ seminales. *Vesica'lis inferior*: base bladder, prostate, and vesiculæ seminales. *Hæmorrhoida'lis media*: rectum, *anas.* with hæmorrhoidal branch of inferior mesenteric and internal pudic. (*Uterine*: to neck, and ascends to fundus, giving branch to ovary and tube, etc. *Vaginal*: corresponds to inferior vesicle, supplying vagina, urethra, etc.) *Obturatoria*: forwards to superior border obturator foramen, escaping there, dividing into an *internal* (curving round inner border foramen, supplying adjacent muscles, etc., *anas.* with external branch and internal circumflex) and *external* branch (round outer margin foramen supplying adjacent muscles). The branches inside the pelvis are *iliac*, *vesical* and *pubic*; the latter *anas.* with epigastric. Sometimes rises from epigastric, then liable to be wounded in operation for hernia. *Pudica interna*: terminal branch; supplies external generative organs; out of pelvis beneath pyriformis (great sacro-sciatic foramen), crosses ischic spine, re-enters pelvis through lesser sacro-sciatic foramen, ascends ischic ramus up to pubes. *Hæmorrhoidales inferiores*, 2 or 3 to rectum, etc. *Superficialis perinæi*, to scrotum and perinæum. *Transversa perinæi*. *A. corporis bulbosi*, to bulb and Cowper's gland. *A. corporis cavernosi*, terminal branch running forwards in this structure. *Dorsalis penis*, forwards to glans. *Sciatica*: terminal branch (see lower extremity.) Branches from the POSTERIOR trunk are: *Glutea superior*: (see lower extremity.) *Ilio-lumbalis*: divides at upper part iliac fossa into *lumbæ* (to psoas and quadratus muscles, branches to spinal canal) and *iliac* branch (to iliacus internus, *anas.* with gluteal, epigastric, etc.) *Sacrales laterales*: (2) *superior*, enters 1st or 2d sacral foramen, *anas.* with fellows and middle sacral; *inferior*, descends on sacrum, *anas.* over coccyx with middle sacral and opposite fellow.

**ILYACA EXTERNA**: from bifurcation common iliac to femoral arch. Line drawn from left of umbilicus to a point on Poupart's ligament midway between pubes and anterior superior spinal process of ilium, indicates its course. *Epigastrica*: few lines above Poupart's, up- and inwards to umbilicus, there *anas.* with internal mammary and inferior intercostal. *Spermatica externa*, to cremaster. *Pubic* branch. *Musculares*. *Circumflexa ilii*: origin opposite above from outer side

artery, runs obliquely up- and outwards on iliac crest, supplying adjacent muscles, and *anas.* with gluteal, epigastric, and lumbar arteries.

### VEINS.

**Innominate**; *right* is short ( $1\frac{1}{2}$  inches long), running from sterno-clavicular articulation to join left innominate at inferior border cartilage of 1st rib, forming vena cava superior. Is external to artery, and receives right lymphatic duct, right vertebral, right internal mammary, right inferior thyroid and right superior intercostal veins. *Left* is 3 inches long, runs in front of the three large arterial branches of aorta; receives corresponding venous branches as right. Neither have valves.

**Mamma'ria inter'na**: 2 to each artery, uniting in single trunk, emptying into innominate.

**Thyroid'e'a inf'e'rior**: (sometimes 3 or 4) from thyroid venous plexus, emptying into right and left innominate.

**Intercosta'les superio'res**: from 2 or 3 superior intercostal spaces, emptying into innominate. Left bronchial empties into left intercostal.

**Ve'na ca'va supe'rior**:  $2\frac{1}{2}$  to 3 inches long, formed of venæ innominate, emptying into right auricle; receives vena azygos major, and pericardial veins. No valves.

**Azygos ma'jor**: opposite 1st or 2d lumbar vertebra, from right lumbar veins, up through aortic diaphragmatic opening to right side 3d dorsal vertebra, arching over root right lung, emptying into vena cava. Receives the 10 lower right intercostal veins, vena azygos minor, several œsophageal, mediastinal, vertebral, and right bronchial veins. Imperfect valves, though its branches have complete ones.

**Azygos mi'nor inf'e'rior**: lumbar region of left side from lumbar veins, or branches of renal, through left crus of diaphragm to 6th or 7th dorsal vertebra, there crossing to terminate in azygos major. Receives 4 or 5 lower intercostal, and some œsophageal and mediastinal veins.

**Azygos mi'nor supe'rior**: from branches intercostal and azygos minor inferior veins; empties into one of the other azygos veins.

**Bronchia'es**: from lungs; the right terminating in azygos major; the left in the left superior intercostal.

**Spina'les**: *dorsi-spina'lis*, whole length of back of spine, forming network, terminating in the vertebral (of neck), the intercostal (of thorax), lumbar and sacral veins. *Longitudina'les spina'les anterie'ores*, whole length vertebral foramen;

anterior surface terminating as dorsi-spinal, etc. *Longitudinales spinales posteriores*, whole length vertebral foramen, posterior surface, terminating in dorsi-spinal. *V. basis vertebrarum*, from bodies of vertebræ, terminating in anterior longitudinal. *Medullæ-spinales*, cover cord, between pia and arachnoid, from sacrum to occiput; *anas.* freely with those contiguous. No valves in any of the spinal veins.

*Iliaca externa, interna and communis*, see lower extremity.

*V. cava inferior*: junction of the 2 common iliacs, up on right side of aorta, terminating in lower and back part of right auricle. It receives: the *lumbar* branches (3 or 4 in No.) from muscles and integument of loins; the *right spermatic* (the left emptying into left renal), both having valves; *ovarian*, have same termination; the *renal*, the left being the longer; the right *supra-renal* (the left terminating in the left renal, or phrenic); the right *phrenics* (the left superior emptying into superior intercostal or internal mammary, and the inferior into the left renal); the *hepatic*, 3 branches (no valves), these commencing as the *intra-lobular* veins (in the centre of the lobule), forming the *sub-lobular*, and these last finally the larger hepatic trunks.

*V. porta*: 4 inches long; no valves in it or its branches; formed by *mesenterica inferior*, (draining rectum, sigmoid flexure, and descending colon; its branches *inosc.* with internal iliac); *mesenterica superior* (draining small intestines, cæcum, ascending and transverse colon); *splenicæ* (5 or 6 branches from spleen; receiving branches of *va'sa bre'via*, left *gas'tro-epiplo'ica*, *pancreat'ica* and *pancreat'ico-duodenu'lis* veins); *gas'trica*, from lesser stomachic curvature.

*Cardiacæ*: *v. cordis magna*, from apex, up anterior interventricular groove to base ventricles, curving to left side to back part of heart, emptying into coronary sinus, guarded by 2 valves; receives posterior cardiac and left cardiac veins. *V. cordis media*, (posterior cardiac) from apex up posterior interventricular groove, terminating in coronary sinus, guarded by valve. *V. parvæ*, (anterior veins), 3 or 4 small branches from anterior surface of right ventricle, emptying into lower part right auricle. *V. thebesii* drains muscular substance, opening into right auricle.

*Pulmonales*: 4 in No.; commence in capillary network upon *bronchial cells*, uniting to form a trunk for each lobe, the one of the middle lobe of the right lung unites with the one from the superior lobe, hence 2 veins from each side. No valves; carry arterial blood.

## NERVES.

**SPINAL NERVES:** 31 pairs, viz.: 8 cervical, 12 dorsal, 5 lumbar, 5 sacral, 1 coccygeal. Each have an anterior and posterior root, hence have moto-sensor functions.

**Cervical'es:** (see pages 15 and 16). **Dorsal'es:** 1st from between 1st and 2d dorsal vertebræ, the last from between 12th dorsal and 1st lumbar. The **POSTERIOR** branches have *external* and *internal* branches. The *cutaneous* branches are the 6 upper from the internal branches, the 6 lower from the external branches. These nerves supply the structures of the back. **ANTERIOR** branches supply walls of the chest and abdomen, each having branches from the sympathetic. *Superiores Intercostales*, pass forwards with the arteries, giving off numerous branches, the chief being the lateral cutaneous, which have anterior and posterior branches. The 1st intercostal has no lateral branches; the 2d has a large one (the *intercosto-humeralis*), which supplies the integument of upper inner half of arm. *Intercostales inferiores*, have nearly the same course as the superior, supplying the anterior cutaneous nerves to abdomen, and having lateral branches.

**Lumbal'es:** have largest roots of all; have *anterior* and *posterior* branches; the latter having external and internal branches; the *anterior* branches uniting to form the lumbar plexus. Supply muscles and integument in their region. The *anterior* branches communicate with sympathetic. **Sacral'es** and **Coccygeal'es:** (see nerves of lower extremity.)

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## LOWER EXTREMITY.

## MUSCLES.

## (1) ILIAC REGION 3.

**Psoas magnus:** last dorsal and all lumbar vertebræ (transverse processes)—lesser trochanter, in union with iliacus. [Anterior branches lumbar.]

**Psoas parvus:** sides of bodies last dorsal and 1st lumbar vertebræ—ilio-pectineal eminence. [Anterior branches lumbar.]

**Iliacus:** iliac fossa, crest and anterior spinous processes of ilium, base sacrum—outer side tendon psoas magnus. [Anterior crural.]

## (2) ANTERIOR FEMORAL REGION 7.

**Tensor vaginæ femoris:** outer crest ilium, anterior superior spinous process—fascia lata,  $\frac{1}{4}$  way (laterally) down the thigh. [Superior gluteal.]

**Sartorius**: (longest muscle of body) anterior superior spinal process ilium, part of notch below—upper, inner side of tibial shaft, having crossed the anterior surface of the thigh obliquely. [Anterior crural.]

**Quadriceps extensor**: (*vas'ti inter'nus* and *exter'nus*, *rec'tus* and *crure'us*); the *rec'tus* from anterior inferior spinal process ilium and groove above acetabulum,—the *vas'tus exter'nus* from anterior border great trochanter, *linea aspera*,—the *vas'tus inter'nus* and *crure'us* from inner lip of *linea aspera* and nearly all internal, anterior and external surface of femur—shaft—into patella. [Anterior crural.]

**Subcrure'us**: lower anterior surface of femur—synovial pouch behind patella. [Anterior crural.]

### (3) INTERNAL FEMORAL REGION 5.

**Grac'le**: inner margin rami of pubes and ischium—inner side upper part tibia above insertion semitendinosus and beneath sartorius. [Obturator.]

**Pectine'us**: Gimbernat's ligament, *linea ilio-pectinea*—rough line between trochanter minor and *linea aspera*. [Obturator and anterior crural.]

**Adduc'tor lon'gus**: front of pubes—middle 3d of *linea aspera*. [Obturator.]

**Adduc'tor bre'vis**: descending ramus of pubes between gracilis and obturator—upper part *linea aspera*, behind pectineus. [Obturator.]

**Adduc'tor mag'nus**: ramus of pubes and ischium, and tuber ischii—from great trochanter to inner condyle. [Obturator and great sciatic.]

### (4) GLUTEAL REGION 9.

**Glute'us max'mus**: superior curved line of ilium down to coccyx and sacro-sciatic ligaments—rough line between great trochanter and *linea aspera*. [Inferior gluteal branch sacral plexus.]

**Glute'us me'dius**: between superior and middle iliac curved lines, crest, fascia—great trochanter. [Superior gluteal.]

**Glute'us min'mus**: between middle and inferior curved lines, margin great sacro-sciatic notch—impression anterior border trochanter major. [Superior gluteal.]

**Pyriformis**: front of sacrum, anterior margin great sacro-sciatic foramen and anterior surface great sacro-sciatic ligament, etc.—through great sacro-sciatic foramen to superior border great trochanter. [Sacral plexus.]

**Obtura'tor inter'nus**: inner margin obturator foramen, pubic and ischic rami, and obturator membrane—through less

sacro-sciatic foramen to superior border great trochanter in front of pyriformis. [Sacral plexus.]

**Gemellus superior:** outer surface of spine of ischium—horizontally outwards to superior border great trochanter, in company with obturator internus. [Sacral plexus.]

**Gemellus inferior:** superior outer border tuber ischii—superior border great trochanter with obturator internus. [Sacral plexus.]

**Obturator externus:** inner side obturator foramen, pubic and ischic rami, internal  $\frac{2}{3}$  of external surface obturator membrane—out- and backwards to digital fossa of femur. [Obturator]

**Quadratus femoris:** outer border tuber ischii—horizontally outwards to linea quadrati of posterior surface of great trochanter. [Sacral plexus.]

#### (5) POSTERIOR FEMORAL REGION 3.

**Biceps:** long head from tuber ischii, short head from linea aspera—outer side head fibula, covering external lateral ligament. Forms outer “ham-string.” [Great sciatic.]

**Semi-tendinosus:** tuber ischii in company with biceps, and the aponeurosis—tendon (inner side popliteal space) curves round internal tibial tuberosity to inner surface of shaft (external and beneath sartorius.) [Great sciatic.]

**Semi-membranosus:** tuber ischii, above and external to biceps and semi-tendinosus—back of tibial tuberosity in 3 digitations, beneath internal lateral ligament. The two preceding, with this, and gracilis and sartorius, form inner “hamstring.” [Great sciatic.]

#### (6) ANTERIOR TIBIO-FIBULAR REGION 4.

**Tibialis anticus:** outer tibial tuberosity and superior  $\frac{3}{4}$  shaft, external surface—inner under surface internal cuneiform and base 1st metatarsus. [Anterior tibial.]

**Extensor proprius pollicis:** middle anterior surface fibula and interosseous membrane—base last phalanx great toe. [Anterior tibial.]

**Extensor longus digitorum:** external tuberosity tibia, upper  $\frac{3}{4}$  anterior surface shaft of fibula, interosseous membrane—3 tendons distributed to 4 lesser toes. (Anterior tibial.)

**Peroneus tertius:** part of above, lower outer fourth fibula—base 5th metatarsus. [Anterior tibial.]

#### (7) POSTERIOR TIBIO-FIBULAR REGION, SUPERFICIAL LAYER, 3.

**Gastrocnemius:** 2 heads, one from each femoral condyle—unites with soleus to form tendo Achillis, inserted into posterior surface of calcis. [Internal popliteal.]

**Sole'us**: oblique line tibia, back of head and superior portion fibular shaft—os calcis. [Internal popliteal.]

**Planta'ris**: outer surface external femuric condyle and posterior ligament knee-joint—os calcis, posterior surface. Noted for long, slim tendon. [Internal popliteal.]

(8) POSTERIOR TIBIO-FIBULAR REGION, DEEP LAYER, 4.

**Poplite'us**: (forms floor popliteal space) depression below tuberosity of external femuric condyle—inner  $\frac{3}{4}$  triangular space above oblique line on posterior surface tibia. [Internal popliteal.]

**Flex'or lon'gus polli'cis**: lower internal  $\frac{3}{4}$  fibular shaft, interosseous membrane, muscular septum and fascia—through groove in tibia, astragalus, calcis to base last phalanx big toe. [Posterior tibial.]

**Flex'or lon'gus digito'rum**: posterior surface tibia below oblique line, intermuscular septum—behind inner malleolus, calcic arch, joined by tendon flexor accessorius, divides into 4 tendons which pass through slits in the tendons of flexor brevis digitorum to be inserted into bases of last phalanges of the 4 outer toes. [Posterior tibial.]

**Tibia'lis Post'icu'**: interosseous membrane, superior  $\frac{3}{4}$  posterior surface tibial shaft, superior  $\frac{3}{4}$  fibula, inner surface—behind inner malleolus, beneath calcaneo-scaphoid articulation to tuberosity scaphoid and internal cuneiform. [Posterior tibial.]

(9) FIBULAR REGION 2.

**Perone'us lon'gus**: head, and upper, outer  $\frac{3}{4}$  fibular shaft, muscular fascia and septa—behind external malleolus, through cuboid groove to outer side base 1st metatarsus. [Musculo-cutaneous.]

**Perone'us bre'vis**: middle  $\frac{3}{4}$  outer surface fibular shaft, muscular septa—behind external malleolus to dorsal surface base 5th metatarsus. [Musculo-cutaneous.]

(10) FOOT, DORSAL REGION, 1.

**Exten'sor bre'vis digito'rum**: outer side os calcis, astragalo-calcanean ligament, anterior annular ligament—4 tendons, the 1st into 1st phalanx of great toe, the rest into outer sides of tendons of long extensor to 2d, 3d and 4th toes. [Anterior tibial.]

(11) FOOT, PLANTAR REGION, 1ST LAYER, 3.

**Abduc'tor polli'cis**: inner tuberosity os calcis, internal annular ligament, plantar fascia—inner side base 1st phalanx great *e.* [Internal plantar.]

- **bre'vis digito'rum**: internal tuberosity os calcis, plantar



fascia, muscular septa—4 tendons, sides 2d phalanges of outer toes. [Internal plantar.]

**Abduc'tor min'im'i dig'it'i**: outer tuberosity os calcis, plantar fascia, muscular septum—outer side base 1st phalanx little toe, joins tendon of short flexor. [External plantar.]

(12) FOOT, PLANTAR REGION, 2D LAYER, 2.

**Flex'or acco:ss'o'rius**: *inner* head from inner surface os calcis and calcaneo-scaphoid ligament; *outer* head, inferior surface os calcis and plantar ligament—tendon flexor longus digito-rum. [External plantar.]

**Lumbric'a'les**: (4); tendon of long flexor—inner sides bases of 2d phalanges of 4 outer toes. [Internal plantar to 1st and 2d; external plantar to 3d and 4th.]

(13) FOOT, PLANTAR REGION, 3D LAYER, 4.

**Flex'or bre'vis pol'licis**: internal border of the cuboid and contiguous surface of external cuneiform, tendon of tibialis posticus—outer and inner sides base 1st phalanx big toe [Internal plantar.]

**Adduc'tor pol'licis**: tarsal extremity of 2d, 3d and 4th metatarsi and sheath of peroneus longus—outer side base 1st phalanx big toe. [External plantar.]

**Flex'or bre'vis min'im'i dig'it'i**: base of 5th metatarsus and sheath peroneus longus—outer side base 1st phalanx little toe. [External plantar.]

**Trans'ersus pe'dis**: under surface head 5th metatarsus, transverse ligament of metatarsus—outer side 1st phalanx of big toe. [External plantar.]

(14) FOOT, PLANTAR AND DORSAL INTEROSSEOUS REGION, 7.

**Interos'sei dors'a'les**: (4); bipenniform, from adjacent sides of metatarsi—bases of 1st phalanges, outer (except the 1st) side of the 4 outer toes. **Planta'res**: (3); arise from the shafts of the 3d, 4th and 5th metatarsi, inner side—inner sides of the bases of the 1st phalanges of the same toes, and common extensor tendon. [External plantar.]

## ARTERIES.

**SCIATICA**: (3 branches): larger terminus of anterior trunk of internal iliac; out through lower part of the great sacro-sciatic foramen, resting on pyriformis, descending between tuber ischii and great trochanter, to supply muscles of the thigh. **Coccygea'lis**: inwards, *piercing* great sacro-sciatic ligament, supplying glutæus maximus and integument. **Tub'a'les inf'eri'o'res**: 3 or 4 supplying glutæus maximus. **Co'm'es'ci' ischiad'ici**: accompanying great sciatic nerve, and fir

*pierces* it and is lost in its substance. *Muscula/res*: to back part of hip, *anas.* with gluteal, superficial perforating, external and internal circumflex. *Articula/res*: to hip-joint capsule.

**GLUTEA SUPERIOR**: largest branch of internal iliac; out above pyriformis, dividing into deep and superficial branches; supplies iliatus, obturator internus, pyriform. *Superficial* branch, beneath glutæus maximus, supplying it; *anas.* with posterior branch sacral. *Deep* branch, between glutæus medius and glutæus minimus, the superior division *anas.* at anterior superior spinous process of ilium with circumflex iliac and external circumflex; the inferior division goes to great trochanter, *anas.* with external circumflex. Branches supply all muscles in this region, also joint.

**FEMORALIS**: (7 branches); from Poupart's ligament to opening in adductor magnus. A line drawn from the middle of said ligament to internal femuric condyle lies over its course. Vein lies on inside; anterior crural nerve on the outside of artery. *Superficialis epigastrica*:  $\frac{1}{2}$  inch below Poupart's ligament through saphenous opening upwards to umbilicus in the fascia covering the external oblique abdominis; *anas.* deep epigastric and internal mammary. *Superficialis circumflexa ilia*: arises close to above, outwards to iliac crest, supplying glands fascia and integument, *anas.* circumflex iliac, gluteal, external circumflex. *Superficialis externa pudica*: inner side,  $\frac{1}{2}$  inch below Poupart's ligament, pierces fascia lata, crosses spermatic cord, supplies integument of lower part of abdomen, penis, scrotum, (or labia); *anas.* internal pudic branches. *Profunda externa pudica*: passes inwards on pectineus, piercing fascia at pubes, supplies integument of perinæum, scrotum, (or labia), *anas.* superficial perinæal. *Profunda femoris*: outer and back part, 1 to 2 inches below Poupart's ligament, passes back of artery and the femoral vein to inner side femur, terminating in adductor magnus, lower 3d, *anas.* with popliteal and inferior perforating. *Circumflexa externa*, having ascending, descending and transverse branches, supplying muscles in that region, and *anas.* with gluteal, circumflex iliac, superior articular of popliteal, near great trochanter with sciatic, superior perforating and internal circumflex. *Circumflexa interna*, inwards to joint, supplying contiguous muscles, and head of femur; *anas.* with obturator, sciatic, external circumflex and superior perforating. *Perforantes*, the "superior," supplying adductors magnus and brevis, biceps, glutæus maximus and *anas.* with sciatic, internal circumflex and middle perforating; "middle" one supplies flexors of thigh and

nutrient artery, *anas.* with its fellows; the "inferior" supplies the thigh flexors, *anas.* with its fellows and terminal branch of profunda. *Muscula'res*: 2 to 7 in No., supplying sartorius and vastus internus. *Anastomotica magna*: arises just before the femoral pierces the adductor magnus, dividing into *superficial* branch, accompanying long saphenous nerve, to supply integument; *deep* branch descends to inner side of knee, where it *anas.* with superior internal articular and recurrent of anterior tibial, and supplies knee-joint and contiguous parts.

**POPLITEA**: (7 branches); from termination of femoral down to lower border of popliteus muscle, dividing into anterior and posterior tibial. Nerve and vein superficial to artery. *Muscula'res*: *superior* (2 or 3), supply vastus externus and thigh flexors; *anas.* inferior perforating, terminal branches profunda. *Inferior* (2), supply gastrocnemius heads and plantaris. Arise opposite knee-joint. *Cuta'nei*: supply integument of calf of leg. *Articula'res superio'res*: *internal*, running inwards over femur condyles, *anas.* with anastomotica magna, inferior internal articular and superior external articular, supplying vastus internus and knee-joint. *External*, running circularly outwards above femur condyles, supplying vastus externus, knee-joint, etc.; *anas.* with external circumflex, and with anastomotica magna forming an arch. *Azygos articula'ris*: opposite bend of joint, piercing posterior ligament, supplies ligaments, synovial membranes and joint. *Articula'res inferio'res*: wind round tibial head; the *internal*, beneath internal lateral ligament, etc., to front and inner side of joint, supplying tibial head and joint. The *external*, beneath external lateral ligament, etc., to front of joint, *anas.* with the one of opposite side, superior articular and anterior tibial recurrent.

**TIBIALIS ANTERIOR**: (3 branches); forward through interosseous membrane and 2 heads of tibialis posticus, lying upon anterior surface of interosseous membrane down to front of ankle, there becoming dorsalis pedis. A line drawn from inner fibular head to midway between the 2 malleoli indicates its course. Has *venæ comites*; the anterior tibial nerve lies a little superficial and to its outer side. *Recur'ens*: arises just as artery passes through interosseous membrane, running up in tibialis anticus muscle to front of joint, *anas.* with the articulares. *Muscula'res*: numerous, supplying integument and muscles throughout the course; *anas.* with branches from posterior tibial and peroneal. *Malleola'res*: *internal* arises a

inches above articulation, inwards, beneath tendons ramifying upon inner malleolus, *anas.* with branches from posterior tibia and internal plantar. *External*, outwards beneath tendons, supplying outer malleolus, *anas.* with anterior peroneal, and tarsea branch of dorsalis pedis.

**DORSALIS PEDIS:** (4 branches); from bend of ankle to 1st interosseous space, there dividing into communicating and dorsalis hallucis. *Venæ comites*; anterior tibial nerve lies on outer side. *Tarsea*: arises over scaphoid, passing outwards beneath extensor brevis digitorum, supplying that muscle and tarsal articulations; *anas.* metatarsal, external malleolar, peroneal, and external plantar. *Metatarsæ*: outwards over metatarsal heads, giving off 3 *interosæ* branches which pass forwards to clefts of the 3 outer toes, there dividing to supply adjacent sides of the toes, and outer side of little toe. *Anas.* with tarsea and external plantar; the 3 interosseous, each, receive a posterior perforating branch from plantar arch near their origin, and each a branch from anterior perforating of digital near the toe-clefts. *Dorsalis hallucis*: forwards along outer border 1st metatarsus to 1st toe-cleft, there dividing to supply inner side of big toe, and the adjacent sides of big and ad toes. *Communicans*: dips down into sole, *anas.* with external plantar to form plantar arch, there dividing to supply toes same as dorsalis hallucis.

**TIBIALIS POSTERIOR:** (5 brs.); from lower border popliteus, parallel inner border tendo Achillis, to fossa between inner ankle and heel, there dividing into the plantar arteries. Has *venæ comites*; nerve to the outside for the lower  $\frac{3}{4}$  of its course. *Peronæa*: from 1 inch below popliteus, obliquely outwards to fibula, descending along inner border of it to outer ankle, supplying contiguous structures, *anas.* with external malleolar, tarsal, and external plantar. *Anterior peronæa*, given off 2 inches above ankle, piercing interosseous membrane, passes down to front of outer ankle and tarsus, supplying adjacent structures, *anas.* with tarsal and external malleolar. *Nutritia*, to fibula. *Musculares*, to fibular muscles. *Nutritia*: near origin of posterior tibia, being largest of its kind in the body; enters tibia just below oblique line. *Musculares*: to soleus and deep muscles. *Communicans*: transversely across tibia 2 inches above its inferior extremity to *anas.* with peroneal. *Calcanæ internæ*: several branches arising just before division of posterior tibial, supplying fat & integument about heel, and muscles of inner side of foot; & with peroneal, internal malleolar.

**PLANTARIS INTERNA:** forwards along inner side of foot to big toe, *anas.* with digital branches, supplies abductor pollicis, flexor brevis digitorum, etc.

**PLANTARIS EXTERNA:** (2 brs.); out- and forwards to base 5th metatarsus, then turning obliquely inwards to 1st interosseous space, *inosc.* with communicating branch from dorsalis pedis, forming *plantar arch*. *Perforantes posteriores:* (3); ascend through back part of the 3 outer interosseous spaces; *anas.* with interosseous branches of metatarsal. *Digitales:* (4); arise from arch and supply both sides of the 3 outer toes and outer side of the 2d toe, bifurcating at the respective toe-clefts to do this. At each bifurcation a branch (the *anterior perforating*) is sent upwards through the interosseous space; *anas.* with interosseous branches of the metatarsal.

### VEINS.

**Saphena interna,** or *long saphenous:* from plexus at dorsum and inner side of foot, ascends, in front of inner ankle, behind inner margin of tibia, bends behind inner femur condyle; empties into femoral through saphenous opening,  $1\frac{1}{2}$  inches below Poupart's ligament, where it receives *superficialis circumflexa iliaca*, *superficialis epigastrica*, and *superficialis externa pudica*. Communicates with internal plantar, tibial, etc. 2—6 valves.

**Saphena externa:** plexus at dorsum and outer side of foot, up behind outer ankle to median line of leg, accompanied by external saphenous nerve; empties into popliteal vein, between heads of gastrocnemius. 2 valves, one near termination. *Communicates* with deep veins of foot.

**Tibiales posteriores:** formed from *external* and *internal plantar* joining with the *peroneal*. Course same as artery.

**Tibiales anteriores:** continuation of *vena dorsalis pedis*, pierce interosseous membrane at upper part of leg, and form, by junction with the *posterior tibial* veins, the popliteal.

**Poplitea:** (see tibial anterior) up to tendinous aperture of adductor magnus, there becoming the femoral; receives *sural*, *articular*, and *external saphenous* veins. 4 valves. Crosses artery from within outwards.

**Femoralis:** (see above); up to Poupart's ligament, there becoming external iliac. Lies (below) to outside, but crosses beneath the artery to its inside. Receives *muscular* branches, and *profunda femoris*, and *internal saphenous* at  $1\frac{1}{2}$  inches below Poupart's ligament. 4 or 5 valves.

**Iliaca externa:** (see above); to sacro-iliac symphysis, there

uniting with internal iliac to form common iliac. On right side, lies to inside of artery at first, but gradually passes behind it. On left side, altogether on inside of artery. Receives *epigastric* and *circumflex iliac*. No valves.

**Iliacal inter'as**: formed by venæ comites of *all* the branches of the iliac artery, but the umbilical; lies first to inside, but finally gets behind the artery. No valves, though the plexus that help form it are abundantly supplied. 1. *Hæmorrhoidal* plexus; 2. *vesico-prostatic* plex.; 3. *vaginal* plex.; 4. *uterine* plex.; 5. *dorsalis penis* plex.; these all intercommunicate very freely.

**Iliaca commun'is**: (see *iliaca externa*); terminates at intervertebral substance between 4th and 5th lumbar vertebræ, there, with its fellow of opposite side, forms vena cava inferior. On the right it is the shorter, and nearly vertical. Receives *ilio-lumbar*. and sometimes *lateral sacral* veins. *Middle sacral* empties into left common iliac. No valves.

#### NERVES.

**LUMBAR PLEX'US**: formed by anterior roots of the 4 upper lumbar nerves communicating with each other. It furnishes different nervous branches to supply the inferior extremities. **Ilio-hypogas'trica**: 1st lumbar, outwards to iliac crest, piercing there the transversalis, the *iliac* branch being distributed to gluteal integument; the *hypogastric* supplies the integument in umbilical region. **Ilio-ingui'nalis**: 1st lumbar; escapes at external ring, supplying inner thigh, scrotum (labia in female) and inguinal region. **Gen'to-crus'al**: 2d lumbar and branch from 1st, pierces psoas, and near Poupart's ligament divides; the *genital* branch to genitals, the *crural* to integument on anterior upper aspect of thigh; *communicates* with middle cutaneous. **Cuta'neus exte'rus**: 2d lumbar; perforates psoas, and at Poupart's ligament divides; the *anterior* branch supplying the anterior and external part of thigh to knee; the *posterior*, supplying posterior surface of thigh to its middle. **Obtura'tor**: 3d and 4th lumbar, and at upper part of obturator foramen enters thigh, dividing into: *anterior* branch supplying adductor longus and brevis, pectineus and femoral artery, giving articular branch to hip-joint; *posterior* branch pierces obturator externus, passes to front of adductor magnus, dividing into muscular branches; *articular* branch is given off for knee-joint. **Obtura'tor access'o'rius**: either from obturator, or filaments from 3d and 4th lumbar; supplies pectineus, hip-joint, and a cutaneous branch to leg. Sometimes wanting.

**ANTERIOR CRURA'LIS:** 3d and 4th lumbar, through psoas beneath Poupart's ligament to thigh, external to artery in pelvis, supplies iliacus, and femoral artery; without, all the muscles on front of the thigh but the tensor vaginæ femoris. **Cutaneous medius:** through fascia lata below Poupart's ligament, dividing into 2 branches, supplying sartorius and integument in front as low as knee. **Cutaneous int'rnus,** obliquely across upper part femoral sheath, the *anterior* branch perforating fascia at lower 3d of thigh, supplies integument of inside of thigh to knee-joint; the *inner* branch descends along posterior border sartorius to knee, piercing fascia, giving off numerous branches, descending still farther, supplying integument of inner side of leg. **Saphenous int'rnus,** downwards beneath sartorius to knee, inner side, then along inner side of leg in company with internal saphenous vein, dividing into 2 branches, one terminating at inner ankle, the other distributed to integument of dorsum of foot. Supplies muscles and integument in its course, giving off branches *communicating* with internal cutaneous and obturator nerves; another to patellar integument and forms a "plexus patellæ" with other branches. **Muculares,** all muscles of front of leg but tensor vaginæ femoris. **Articulares,** 2 to knee-joint ligaments.

**SACRA'LES:** 5; the 4 upper through anterior sacral canals, the 5th through the sacro-coccygeal foramen; the posterior are smaller and through posterior sacral canals, except the 5th, which is through posterior sacro-coccygeal foramen. *Have long roots.* *Posterior internal* branches supply multifidus spinæ. *Posterior external* branches supply integument over sacrum, coccyx and posterior gluteal region, forming many anastomosing loops. *Anterior,* the 4 upper supplying rectum, bladder, (vagina) and pelvic viscera (*communicating with sympathetic*), with their muscular branches supplying levator ani, coccygeus, sphincter ani, and integument between anus and coccyx. The 5th pierces coccygeus muscle, supplies integument over coccyx, *communicating* with coccygeal.

**COCCYGEA'LIS:** posterior branch receives branch of *com.* from posterior sacral and is lost in fibrous cover of coccyx. Anterior branch pierces sacro-sciatic linament, supplying integument about coccyx. *Anas.* 5th sacral.

**SACRAL PLEXUS;** is formed by lumbo-sacral, the anterior branches of 3 upper (and part of the 4th) sacral nerves. Is triangular in form, the base corresponding to the exits of nerves, and rests on pyriformis, anterior surface, covered by

fascia. *Musculæ*: supply pyriformis, obturator internus, gemelli, and quadratus femoris. *Glutæus superior*: back part lumbo-sacral, passes through great sacro-sciatic foramen, the *superior* branch supplying glutæus minimus and medius, the *inferior* branch supplying glutæus minimus and medius, and lower portion tensor vaginæ femoris. *Pudicus*: plexus, lower part; out great sciatic foramen, in through the lesser sacro-sciatic foramen, terminating in perineal and dorsal nerves of penis. *Inferior hæmorrhoidalis*, near origin pudic, supplies external sphincter and adjacent integument, *communicates* with inferior pudendal and superficial perineal. *Perinæus*, terminal branch, accompanies perineal artery; the *anterior cutaneous* branches supply scrotum and under part of penis, (labia), and levator ani; the *posterior* branches supply sphincter ani and integument in front of anus, and back part scrotum. The *muscular* branches supply transversus perinæi, accelerator urinæ, erector penis, compressor urethræ, and bulb. *Dorsalis penis*, along ramus ischii, with pudic artery, follows it and its branches to the glans penis, which it supplies. *Anas.* with sympathetic, supplies integument of prepuce and of penis, and corpus cavernosum. (In female, to the analogous parts.)

**SCIATICUS PARVUS**: supplies integument of perinæum, back part of thigh and leg, and glutæus maximus. Two branches from sacral plexus unite to form it; follows course of sciatic artery in distribution, piercing fascia in popliteal region, accompanies external saphenous vein to middle of leg. *Inferiores glutæi*, to glutæus maximus, several large branches. *Internæ cutanæ*, to skin of upper and inner side of thigh, posterior aspect; scrotum by inferior pudendal that curves around tuber ischii. *Ascendentes cutanæ*, run upwards and supply integument of gluteal region, and muscles. Branches to integument of thigh, popliteal region and upper part of leg.

**SCIATICUS MAGNUS**:  $\frac{3}{4}$  inch wide, and continuation of lower part sacral plexus, passing out of great sacro-sciatic foramen below pyriformis, down between great trochanter and tuber ischii to lower 3d of thigh, there dividing into internal and external poplitæus. *Articulæres*, to hip-joint and capsule. *Musculæres*, to flexors of the leg, adductor magnus, *integument of the back part of thigh also supplied by this nerve.*

**POPLITEUS INTERNUS**: (see above); largest terminal branch; down through middle of popliteal space, beneath



soleac arch becoming posterior tibial. *Articula' res*, (3); knee-joint, accompanying superior internal articular, inferior internal articular, and azygos arteries. *Muscula' res*, (4 or 5) to gastrocnemius, plantaris, soleus and popliteus. *Saphe' nus ex-ter' nus*, down between gastrocnemius heads, to middle of leg, there piercing fascia and *anas*. with communicans peronæi, then down along outer margin of tendo Achillis in company with vein, supplying integument of outer side of foot and little toe, *communicates* with musculo-cutaneous.

**TIBIA' LIS POSTE' RIOR**: from lower border popliteus passes down leg with posterior tibial artery, between heel and internal ankle, there dividing into external and internal plantar; above lies to inside of artery, below to outer side. *Muscula' res*, to tibialis posticus, flexor longus digitorum, and pollicis. *Cuta' nous planta' ris*, perforates internal annular ligament, supplying integument of heel and inner side of sole of foot. *Planta' ris inter' nus*: (see above) largest terminal branch accompanying internal plantar artery along inner side of foot. *Cuta' nei*, to sole of foot. *Muscula' res*, to flexor brevis digitorum, and abductor pollicis. *Articula' res*, to tarsus and metatarsus. *Digita' les*, (4); supplying the first 3 toes (both sides) and inner margin of the 4th toe, integument, articulations, nails, etc., and 1st and 2d lumbricales. *Planta' ris exter' nus*: (see tibial posterior) follows course of its artery to outer side of foot, supplying little toe and outer half of 4th toe, and structures adjacent, flexor accessorius, and abductor minimi digiti. *Superficia' lis* branch goes to outer side of 5th and adjacent sides of 4th and 5th toes, flexor brevis minimi digiti, and the 2 interossei of 4th metatarsal space. *Deep* branch supplies remaining interossei, 2 outer lumbricales, adductor pollicis, transversus pedis.

**POPLITE' US EXTER' NUS** (or peronæ' us):  $\frac{1}{2}$  size of internus popliteus (see great sciatic); descends along outer margin of popliteal space to fibula, and about 1 inch below its head divides into anterior tibial and musculo-cutaneous. *Articula' res*: (2) accompanies external articular arteries to outer side of knee. Sometimes a 3d is given off as a recurrent, which supplies front of knee. *Cuta' nei*, (2 or 3); supply integument of back and outer side of leg as far as its lower 3d. *Communi' cans peronæ' i*, arises near fibular head, joining external saphenous at middle of leg. *Tibia' lis ante' rior*: (see above) passes obliquely forwards to front of interosseous membrane, reaching outer side of anterior tibial artery at middle of leg, descending thence to front of ankle it divides into external and internal



to the atlas are attached 20; to the axis, 11; to the remaining (anteriorly) 20, (posteriorly) 22. [The vertebræ are developed from 3 centres by ossification, the first appearing at 6th week; at sixteen 4 secondary centers appear, and at twenty-one a circular plate for superior and inferior surfaces of body. A few exceptions, as atlas (2 primitive centers), axis (6), 7th cervical and the lumbar (5).]

**Sacrum**: triangular, anterior and posterior foramina, lateral masses, laminae, tubercular transverse processes, promontory, sacral canal and groove, auricular surface. *Articulations* (4); 2 innominate, 5th lumbar, coccyx. *Muscles*, (5); pyriform, *coccygeus*, *glutæus maximus*, *erector spinæ*, *latissimus dorsi*. [35, 8th week.]

**Coccyx**: cornua. *Articulation*, (1); sacrum. *Muscles*, (4); *coccygeus*, *glutæus maximus*, *sphincter* and *levator ani*. [4, birth to puberty.]

**Occipitale**: superior and inferior curved lines, crest, protuberance, foramen magnum, condyles, basilar and jugular processes, pharyngeal spine, anterior and posterior condyloid foramina; fossæ cerebri et cerebelli, torcula protuberance, grooves for occipital, lateral, inferior petrosal, superior longitudinal sinûs and medulla, jugular fossa. *Artic.* (6); 2 parietal, 2 temporal, sphenoid, atlas. *Musc.* (12); occipito-frontalis, *trapezius*, *sterno-cleido-mastoid*, *complexus*, *splenius capitis*, *obliquus superior*, *rectus posticus major* and *minor*, *rectus lateralis*, *rectus anticus major* and *minor*, superior pharyngeus, constrictor. [4, 10th week.]

**Parietale**: eminence, foramen, temporal ridge; Pacchionian depressions, middle meningeal groove, superior longitudinal and lateral sinûs. *Artic.* (5); fellow, occipital, frontal, temporal, sphenoid. *Musc.* (1); temporal. [1.]

**Frontale**: eminence, superciliary ridges, external and internal angular processes, supra-orbital notches and arches, temporal ridges and fossæ, nasal eminence and spine; orbital plates, lachrymal fossa, pulley depression, ethmoid notch, anterior ethmoid foramina, foramen cæcum, meningeal grooves, Pacchionian depressions, frontal and superior longitudinal sinûs (frontal suture). *Artic.* (12); 2 parietal, sphenoid, ethmoid, 2 nasal, 2 superior maxillæ, 2 lachrymal, 2 malar. *Musc.* (3 pr.); *corrugator supercillii*, *orbicularis palpebrarum*, temporal. [2.]

**Temporale**: zygoma, articular eminence, glenoid fossa, Glasserian fissure, vaginal, styloid, mastoid and auditory processes, mastoid foramen, superior and inferior petrosal

and lateral sinûs, aquæductus vestibuli, meatus auditorius internus, hiatus Fallopii, opening for smaller petrosal nerve, depression Casserian ganglion, carotid canal, openings for Jacobson's and Arnold's nerves, aquæductus cochleæ, jugular fossa, stylo-mastoid foramen, auricular fissure, canal for Eustachian tube, and tensor tympani. *Artic.* (5); occipital, parietal, sphenoid, inferior maxilla, malar. *Musc.* (14); temporal, masseter, occipito-frontalis, *sterno-mastoid*, *splenius capitis*, *trachelo-mastoid*, digastric, retrahens aurem, stylo-pharyngeus, stylo-hyoid, stylo-glossus, levator palati, tensor tympani, stapedius. [4, 8th week.]

**Sphenoides**: ethmoid spine, optic groove, olivary process, sella turcica, anterior middle and posterior clinoid processes, cavernous groove; foramina opticum, lacerum anterius, rotundum, Vesalii, ovale, spinosum; spinous, hamular, vaginal and external and internal pterygoid processes; rostrum, pterygoid notch and ridge, scaphoid, pterygoid, temporal and zygomatic fossæ, Vidian and pterygo-palatine canals. *Artic.* (12); all of cranium and 2 malar, 2 palate and vomer. *Musc.* (12 pr.); temporal, external and internal pterygoid, superior constrictor, tensor palati, laxator tympani, levator palpebræ, obliquus superior, internal and external recti, superior and inferior recti. [10, 8th w.]

**Ethmoides**: crista galli, infundibulum, os planum, unci-form process, olfactory foramina, superior meatus, anterior and posterior cells. *Artic.* (15); sphenoid, frontal, 2 sphenoidal turbinated, 2 nasal, 2 superior maxillary, 2 lachrymal, 2 palate, 2 inferior turbinated, vomer. *Musc.* none. [3, 4th m.]

**Nasale**: groove for nasal nerve. *Artic.* (4); frontal, ethmoid, fellow, superior maxilla. *Musc.* none. [1, 8th w.]

**Maxilla superior**: nasal process lachrymal tubercle, orbicular surface, infra-orbital groove and foramen, canine and incisive fossa, canine eminence, alveolar process, posterior dental canals, maxillary tuberosity, middle and inferior meatus, palate process, anterior and posterior palatine canals; antrum. *Artic.* (9); frontal, ethmoid, nasal, malar, lachrymal, inferior turbinated, palate, vomer, fellow. *Musc.* (9); orbicularis palpebrarum, inferior obliquus oculi, levator labii superioris alæque nasi, levator labii superioris proprius, levator anguli oris, compressor naris, depressor alæ nasi, masseter, buccinator. [4, early.]

**Lachrymale**: lachrymal groove. *Artic.* (4); frontal, ethmoid, superior maxilla, inferior turbinated. *Musc.* (1); tensor tarai. [1, 8th week.]

**Mala're**: frontal, zygomatic, orbital and maxillary processes, temporo-malar canal. *Artic.* (4); frontal, sphenoid, temporal, superior maxilla. *Musc.* (5); levator labii superioris proprius, zygomaticus major and minor, masseter, temporal. [1, 8th week.]

**Os pala'ti**: orbital, maxillary, and sphenoid processes, spheno-palatine foramen, superior meatus and superior turbinated crest, middle meatus and inferior turbinated crest, inferior meatus; posterior palatine canal, tuberosity, posterior nasal spine. *Artic.* (7); sphenoid, ethmoid, superior maxilla, inferior and superior turbinated, vomer, fellow. *Musc.* (4); tensor palati, azygos uvulæ, internal and external pterygoid. [1, —.]

**Turbina'tum infe'rior**: lachrymal, ethmoid and maxillary processes. *Artic.* (4); ethmoid, superior maxilla, lachrymal, palate. *Musc.* none. [1, 4th month.]

**Vo'mer**: naso-palatine groove. *Artic.* (6); sphenoid, ethmoid, 2 superior maxilla, 2 palate. *Musc.* none. [2, 8th week.]

**Maxilla're infe'rior**: coronoid process, condyle, ramus, sigmoid notch, mental foramen and process, symphysis, groove for facial artery, inferior dental foramen, mylo-hyoid groove and ridge, sublingual and submaxillary fossæ, genial tubercles. *Artic.* (2); 2 temporal. *Musc.* (14 pr.); levator menti, depressor labii inferioris, depressor anguli oris, *platysma*, buccinator, *masseter*; genio-hyo-glossus, genio-hyoid, mylo-hyoid, *digastric*, superior constrictor, *temporal*, *internal* and *external pterygoid*. [2, early.]

**Hyoi'des**: greater and lesser cornua, body. *Artic.* none. *Musc.* (11); *sterno*-, *thyro*-, *omo*-, *stylo*-, *mylo*- and *genio-hyoid*, genio-hyo-glossus, hyo-glossus, middle constrictor, lingualis, *pulley* of digastric. [5, 8th month.]

**Sterna'm**: *manu'brium*, *gladid'us*, *en'siform appendix*; facets for 7 superior ribs. *Artic.* (16); 7 pairs ribs, 2 clavicles. *Musc.* (10); pectoralis major, sterno-mastoid, sterno-hyoid and sterno-thyroid, triangularis sterni, obliquus externus and *internus*, transversalis, *rectus*, *diaphragm*. [6, 5th month.]

**Co'stæ** (ribs): head, neck, tuberosity, articular and non-articular protuberances, angle, facets for superior and inferior vertebræ. *Artic.* (24); vertebræ and costal cartilages. *Musc.* (19); [3 each, save the last two, these but 2; early.] *Peculiar ribs*: 1st, shortest, most curved, horizontally placed, having grooves for subclavian artery and vein; 2d, some larger than 1st, is not twisted, etc.; 10th, single articular facet; 11th and 12th, single articular facet, no neck or tuberosity.

*extensor minimi digiti* to little finger. **Third row:** *flexor profundus*, and *extensor communis digitorum*.

**Innomina'tum:** crest, superior, middle and inferior curved lines, anterior and posterior superior and inferior spinal processes, greater and lesser sacro-sciatic notches, ilio-pectineal eminence line and groove, acetabulum, cotyloid notch; body, crest, spine, angle of pubes, ischic spine and tuberosity, obturator foramen, ischic and pubic rami; internal iliac fossa, groove for obturator and pubic vessels, symphysis pubis, auricular and sacro-iliac rough surfaces. *Artic.* (3); fellow, sacrum, femur. *Musc.* (33); tensor vaginæ femoris, *obliquus externus* and *internus*, *latissimus dorsi*, *transversalis*, *quadratus lumborum*, *erector spinæ*; 3 *glutæi*, *rectus*, *pyriformis*, *iliacus*, *sartorius*; (*ischium*) *obturator externus* and *internus*, *levator ani*, 2 *gemelli*, *coccygeus*, *biceps*, *semi-tendinosus*, *semi-membranosus*, *quadratus femoris*, *adductor magnus*, *transversus perinæi*, *erector penis*; (*pubes*) *psoas parvus*, *pectineus*, *adductor longus* and *brevis*, *gracilis*, *compressor urethræ*, (*accelerator urinæ*). [8, 3 primary, 5 secondary.]

**Femur:** head, depression for ligamentum teres, neck, greater and lesser trochanters, spiral line, shaft, internal and external tuberosities and condyles; digital fossa, trochanteric line, inter-condyloid notch, *linea aspera*. *Artic.* (3); innominatum, tibia, patella. *Musc.* (23); *glutæus medius* and *minimus*, *pyriformis*, *obturator internus* and *externus*, 2 *gemelli*, *quadratus femoris*; *psoas magnus*, *iliacus*; 2 *vasti*, *glutæus maximus*, *biceps*, 3 *adductors*, *pectineus*, *crureus* and *subcrureus*, *gastrocnemius*, *plantaris*, *popliteus*. [5, 5th w.]

**Patella:** subcutaneous surface; outer and inner facets. *Artic.* condyles of femur, (ligamentum patellæ attaches it to tibia.) *Musc.* (4); *rectus*, *crureus*, *vastus externus* and *internus*. [Sesamoid, 3d year.]

**Tibia:** head, spine, internal and external tuberosity, tubercle, fibular facet, crest, internal malleolus; popliteal notch, oblique line, nutrient foramen, common groove for *flexor longus digitorum* and *tibialis posticus*, another for *flexor longus pollicis*. *Artic.* (3); femur, fibula, astragalus. *Musc.* (10); *semi-membranosus*; *tibialis anticus*, *extensor longus digitorum*; *sartorius*, *gracilis*, *semi-tendinosus*; *popliteus*, *soleus*, *flexor longus digitorum*, *tibialis posticus*, *ligamentum patellæ*. [3, 5th w.]

**Fibula:** head, styloid process, shaft, external malleolus; groove for *peroneus longus* and *brevis*, nutrient foramen. *Artic.* (2); tibia, astragalus. *Musc.* (9); *biceps*, *soleus*, 3 *pero*

nei; extensor longus digitorum and pollicis, tibialis posticus, flexor longus pollicis. [3, 6th w.]

**TARSUS**, (7): *Calcis*: greater and lesser processes, tubercle, superior and inferior grooves. *Artic.* (2); astragalus, cuboid. *Musc.* (8); *tibialis posticus*, *tendo Achillis*, *plantaris*, abductor pollicis and minimi digiti, flexor and extensor brevis digitorum, flexor accessorius. [1, 6th m.] *Oxyphal'des*: *artic.* (4); calcis, external cuneiform, 4th and 5th metatarsi (occasionally scaphoid). *Musc.* (1); flexor brevis pollicis. [1, 9th m.] *Astragalus*: *artic.* (4); tibia, fibula, calcis, scaphoid. *Musc.* none. [1, 7th m.] *Scaphol'des*: *artic.* (4); astragalus, 3 cuneiform (sometimes cuboid). *Musc.* (1); *tibialis posticus*. [1, 4th y.] *Cuneiforme inter'ius*: largest of the three; *artic.* (4); scaphoid, middle cuneiform, 1st and 2d metatarsal. *Musc.* (2); *tibialis anticus* and *posticus*. [1, 3d y.] *Cuneiforme me'dius*: smallest; *artic.* (4); scaphoid, internal and external cuneiform, 2d metatars. *Musc.* none. [1, 4th y.] *Cuneiforme exter'ius*: *artic.* (6); scaphoid, middle cuneiform, cuboid, 2d, 3d, 4th metatarsi. *Musc.* (2); *tibialis posticus*, flexor brevis pollicis. [1, 1st y.]

**METATARSUS**, (5): shaft straight, posterior extremity wedge-shaped, anterior rounded. [2, 8th w.] *1st*: greater size, shortest. *Artic.* (3); internal cuneiform, phalanx, 2d metatarsus. *Musc.* (3); *tibialis anticus*, *peroneus longus*, 1st dorsal interosseous. *2d*: longest. *Artic.* (6); 3 cuneiform, 1st and 3d metatarsi, 2d phalanx. *Musc.* (3); adductor pollicis, 1st and 2d dorsal interosseous. *3d*: *artic.* (4); external cuneiform, 2d and 3d metatarsus, 3d phalanx. *Musc.* (4); 2d and 3d dorsal and 1st plantar interosseous, adductor pollicis. *4th*: *artic.* (5); external cuneiform, cuboid, 3d and 5th metatarsi, 4th phalanx. *Musc.* (4); adductor pollicis, 3d and 4th dorsal and 2d plantar interosseous. *5th*: tubercular eminence. *Artic.* (3); cuboid, 4th metatarsus, 5th phalanx. *Musc.* (5); *peroneus brevis* and *tertius*, flexor brevis minimi digiti, 4th dorsal and 3d plantar interosseous.

**PHALAN'GES**, (14): shaft convex above, concave below; posterior extremity concave, anterior is convex. [2, after metatarsus.] *1st row*: *artic.* metatarsal and 2d row. *Musc.*: big toe, (5); *extensor brevis digitorum*, *transversus pedis*, *abductor*, *adductor* and *flexor brevis pollicis*. Second, (2); 1st and 2d dorsal interosseous. Third, (2); 3d dorsal and 1st plantar interosseous. Fourth, (2); 4th dorsal and 2d plantar interosseous. Fifth, (3); *flexor brevis* and *adductor minimi digiti* 3d plantar interosseous. *2d row*: *artic.* 1st and 3d phalanx

*Musc.* big toe, (2); *extensor* and *flexor longus pollicis*. Remaining toes, (4 each); *flexor brevis digitorum*, and *ext. longus* and *brevis digitorum*, *lumbricales*. 3d row: *artic.* 2d phalanges. *Musc.* (3 each); *extensor longus* and *brevis*, and *flexor longus digitorum*.

**OSSEICULA AUDITUS** (3): *Malleus*: head, neck, manubrium (handle), *processus brevis* and *gracilis*. *Artic.* (1); *incus*. *Musc.* (3); *laxator major* and *minor tympani*, *tensor tympani*. *Incus*: body, short and long processes, *os orbiculare*. *Artic.* (2); *malleus*, *stapes*. *Musc.* none. *Stapes*: head, neck, base, *crura*. *Artic.* (1); *incus*. *Musc.* (1); *stapedius*.

## ACTION OF MUSCLES.

**Head**: moved *forwards* by *platysma myoideus*, *sternomastoid*, *rectus capitis anticus major*, *rectus capitis anticus minor*, (assisted by, when jaw is fixed) *mylo-hyoid*, *genio-hyoid*, *genio-hyoglossus*, *digastricus*. *Backwards* by *trapezius*, *splenius capitis*, *complexus*, *trachelo-mastoid*, *rect. cap. post. maj.*, *rect. cap. post. min.*, *obliquus cap. superior*. *Sideways* by *platysma myoideus*, *sternocleido-mastoid*, *trapezius*, *splenius capitis*, *splen. colli*, *trachelo-mastoid*, *complexus*.

**Neck**: *forwards* by *platysma myoideus*, *sternocleido-mastoid*, *digastricus*, *mylo-hyoid*, *genio-hyoid*, *genio-hyoglossus*, *omo-hyoid*, *sterno-hyoid*, *thyro-hyoid*, *rect. cap. ant. major* and *minor*, *longus colli*. *Backwards* by *trapezius*, *rhomboideus minor*, *serratus posticus superior*, *splenius capitis*, *splenius colli*, *complexus*, *trachelo-mastoid*, *transversalis colli*, *inter-spinales colli*, *rect. cap. post. maj.* and *minor*, *obliquus capitis superior* and *inferior*, *scalenus posticus*, *levator anguli scapulæ*. *Sideways* by the above in conjoined action, and the *scaleni*, *inter-transversales*, *recti-laterales*.

**Trunk**: *forwards* by *rectus abdominis*, *pyramidalis*, *obliquus externus* and *internus abdominis*, *psoas magnus* and *parvus*; assisted by (when arms are carried forwards) *pectoralis major* and *minor*, *serratus magnus*. *Backwards*, *trapezius*, *rhomboideus major*, *latissimus dorsi*, *serratus posticus superior* and *inferior*, *sacro-lumbalis*, *longissimus dorsi*, *spinales dorsi*, *semi-spinalis dorsi*, *multifidus spinæ*, *intertransversalis dorsi et lumborum*. *Laterally*, *obliquus externus* and *internus*, *quadratus lumborum*, *longissimus dorsi*, *sacro-lumbalis*, *serratus posticus*, *latissimus dorsi*.

**Scapula**: *forwards* by *pectoralis minor*, *serratus magnus*, *Backwards*, *trapezius*, *rhomboidei*, *latissimus dorsi*. *Up*



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tores, quad. fem., psoas mag., iliacus, the 3 adductores, biceps femoris.

*Leg:* *Flexed*, semi-tendinosus, biceps, semi-membranosus, gracilis, sartorius, popliteus. *Extended*, rectus fem., crureus & vasti.

*Foot:* *Inwards*, ext. prop. pollicis, flex. long. dig., flex. long. pol., tibialis posticus. *Outwards*, the 3 peronei, ext. long. dig. *Flexed*, tibialis anticus, ext. prop. pol., ext. long. dig., peroneus tertius. *Extended*, gastrocnemius, plantaris, soleus, flex. long. dig., flex. long. pol., tib. posticus, peroneus longus and brevis.

*Toe:* *Flexed*, adductor, abductor, flex. longus and brevis pollicis, abductor and flex. brev. minimi digiti, flex. brev. and longus digitorum, flex. accessorius, lumbricales, interossei. *Extended*, ext. long. and brevis digitorum, ext. prop. pollicis. *Inwards*, abductor pollicis, interossei. *Outwards*, add. pollicis and min. digiti, interossei.

## CIRCULATION.

**Cardiac and pulmonic:** The venæ cavæ receive the systemic venous blood, and convey it into the right auricle; then it passes into the right ventricle (through the tricuspid, or auriculo-ventricular valves, to be thrown into the pulmonic artery (going through the semilunar, or pulmonary valves); is then conveyed to the lungs and oxygenized in the capillary plexus about the intercellular structure and the air-cells, and returned, by the pulmonary veins (4 in number) to the *left* side of the heart, into the left auricle; it then passes into the left ventricle (through the mitral valve) to be forced into the aorta (through the semilunar valves), and from thence to supply the system at large.

**Total:** from the placenta through the umbilical vein to the liver; from thence, by the hepatic veins and *ductus venosus Arantii*, to the inferior vena cava, to the right auricle; the most of the current, guided by the Eustachian valve, passes through the foramen ovale into the *left* auricle, and from thence into the left ventricle, and from thence into the aorta and system at large. A part of the current, however, enters the *right ventricle*, is then forced into the pulmonary artery, and from the imperviousness of the foetal lungs is most all conveyed to the aorta by the *ductus arteriosus Botalli*. The blood is at last conducted by the umbilical *arteries* (branches of the internal iliac) to the placenta for *reoxygenation*.

## RESUME OF OSTEOLOGY.

Name of Bone.	Number of Articulations,	Number of Muscles attached.	Primary Developmental Centres.
Occipital.....	6.....	12.....	4
Parietal.....	5.....	1.....	1
Frontal.....	12.....	3.....	2
Temporal.....	5.....	14.....	4
Sphenoid.....	12.....	12.....	10
Ethmoid .....	15.....	none.....	3
Nasal.....	4.....	none.....	1
Maxillary Sup.....	9.....	9.....	4
Lachrymal.....	4.....	1.....	1
Malar .....	4.....	5.....	1
Palate.....	7.....	4.....	1
Turbinated Inf.....	4.....	none.....	1
Vomer.....	6.....	none.....	2
Maxillary Inf.....	2.....	14.....	2
Hyoid.....	none.....	11.....	5
Sternum.....	16.....	10.....	6
Ribs (12).....	24.....	19.....	34
Clavicle.....	3.....	6.....	2
Scapula.....	2.....	17.....	7
Humerus.....	3.....	24.....	7
Ulna.....	2.....	13.....	3
Radius .....	4.....	9.....	3
Scaphoid .....	5.....	none.....	1
Semilunar.....	5.....	none.....	1
Cuneiform.....	3.....	none.....	1
Pisiform.....	1.....	2.....	1
Trapezium .....	4.....	3.....	1
Trapezoid .....	4.....	1.....	1
Os Magnum.....	7.....	1.....	1
Unciform.....	5.....	2.....	1
Metacarpal (5).....	19.....	18.....	10
Phalanges (14).....	23.....	20.....	28
Vertebræ (24).....	72.....	39.....	85
Sacrum.....	4.....	5.....	11
Coccyx.....	1.....	4.....	4
Innominate.....	3.....	33.....	3 and 5
Femur.....	3.....	23.....	5
Patella.....	1.....	4.....	sesamoid
Tibia.....	3.....	10.....	3

Fibula.....	2.....	9.....	3
Calcis .....	2.....	8.....	1
Cuboid.....	4.....	1.....	1
Astragalus.....	4.....	none.....	1
Scaphoid.....	4.....	1.....	1
Int. Cuneiform.....	4.....	2.....	1
Mid. Cuneiform.....	4.....	none.....	1
Ext. Cuneiform.....	6.....	2.....	1
Metatarsal (5).....	21.....	13.....	10
Phalanges (14).....	23.....	23.....	28
Malleus.....	1.....	3.....	?
Incus.....	2.....	none.....	?
Stapes .....	1.....	1.....	?



## INDEX.

	PAGE.
Arteries : Body.....	29
Extremity (lower).....	39
"    (upper).....	19
Head and Neck.....	6
Body.....	26
Circulation.....	58
Extremity (lower) .....	35
"    (upper).....	16
Head and Neck .....	1
Muscles : Action of.....	56
Body .....	26
Extremity (lower).....	35
"    (upper) ...	16
Head and Neck.....	1
Nerves : Body.....	35
Extremity (lower).....	44
"    (upper).....	23
Head and Neck .....	13
Osteology .....	48
Resume Table of.....	59
Veins : Body.....	33
Extremity (lower).....	43
"    (upper).....	22
Head and Neck.....	11

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